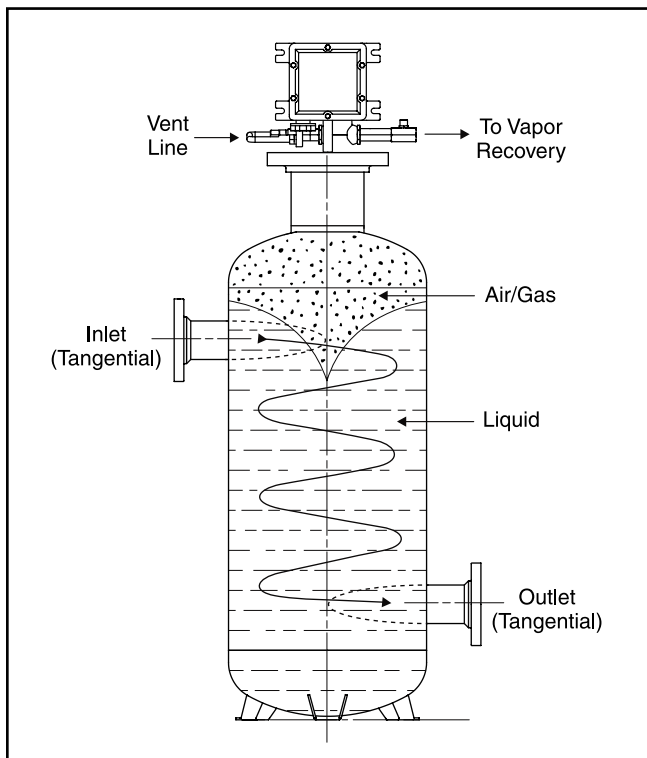


The **Smith Meter® Model VAR Vertical Air Eliminators** separate and release air or gas from petroleum or other liquids before being passed through the meter. Complete elimination of air or gas is essential for accurate metering. Therefore, Smith Meter air eliminators are a necessary part of a metering system whenever there is a possibility of air or gas being present in the flow stream.

### Features

- **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 or other.



**Figure 1 – Operation**

<sup>1</sup> Follow all local, state and federal regulations.



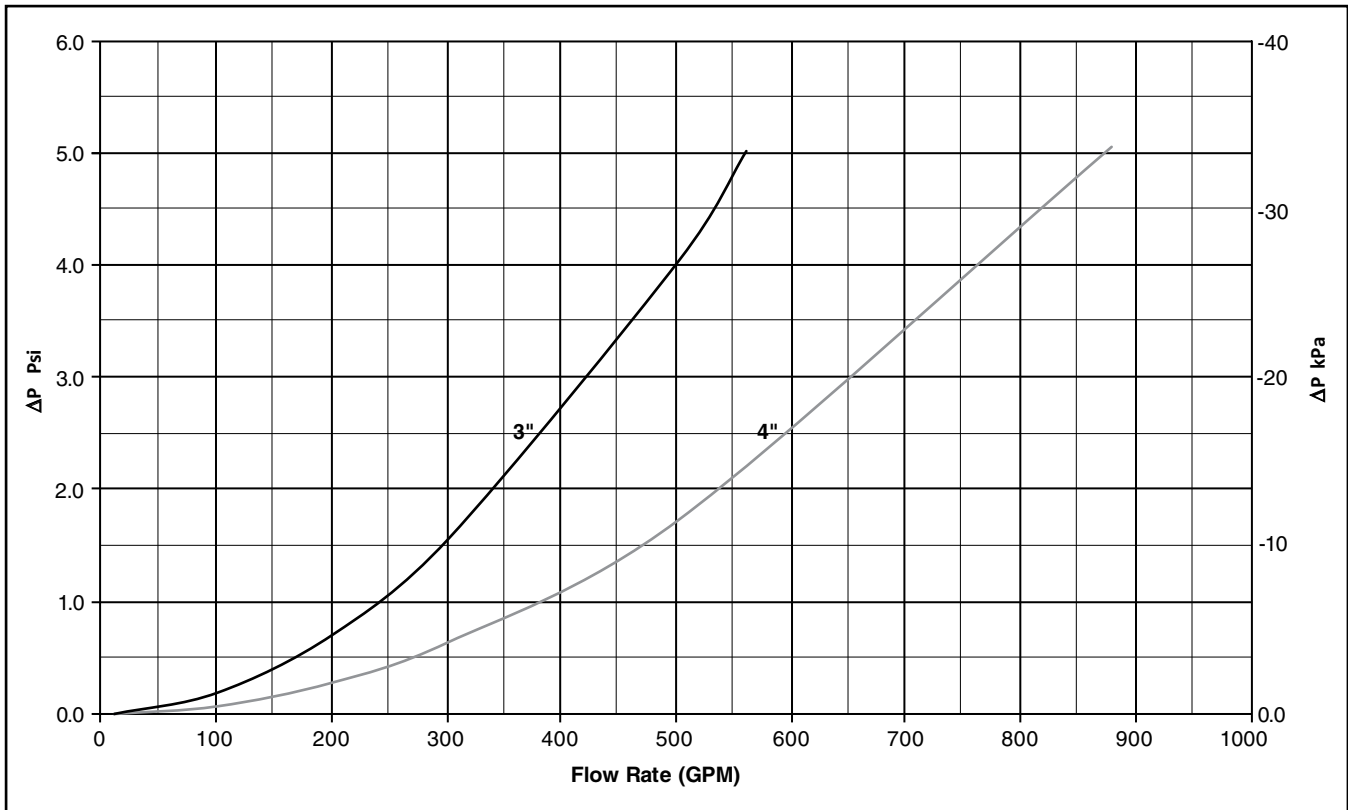
### Principle of Operation

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. This process effectively separates the air from the liquid and the air is then vented via the air release head to a safe environment. This operation is visually shown in Figure 1.

### 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 pressure<sup>1</sup>. A valve may be placed in the air release line near the eliminator, provided the valve is always open except in an emergency.

## Pressure Drop ( $\Delta P$ )



### 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: -20°F to 225°F (-29°C to 107°C) - Buna-N Elastomer.

Optional: 10°F to 400°F (-12°C to 205°C) - Viton Elastomer.

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 Size	Maximum Flowrate at 5 psi differential (API 40.6C 60F) GPM (LPM)
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

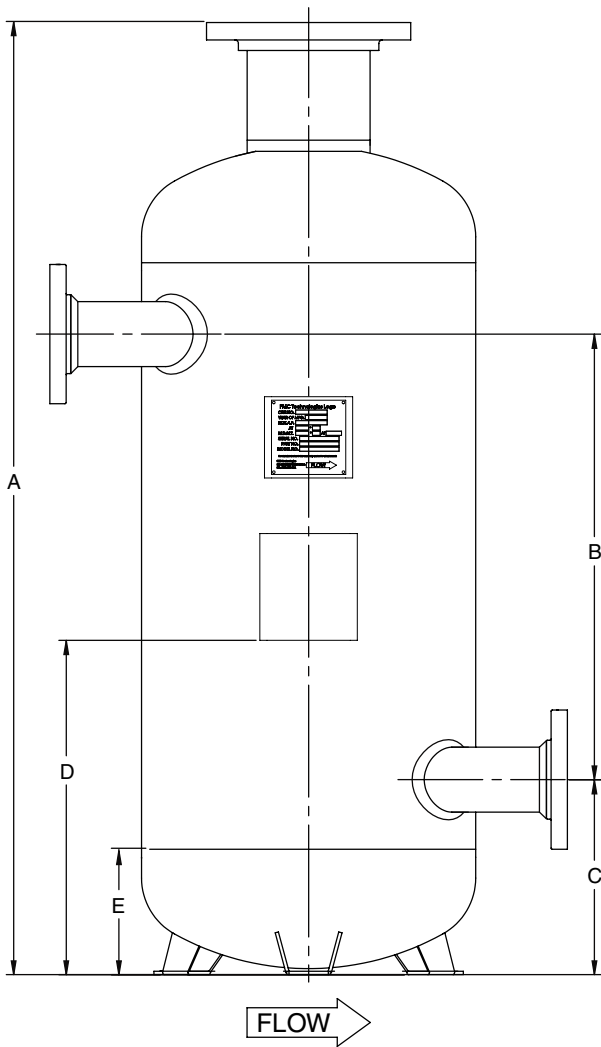
A36

#### Lifting Lugs

SA516 GR. 70

# Dimensions

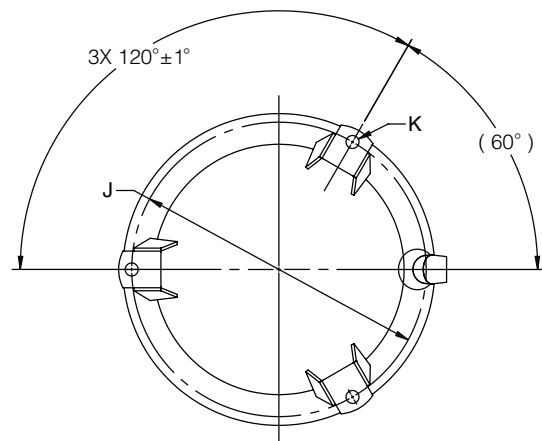
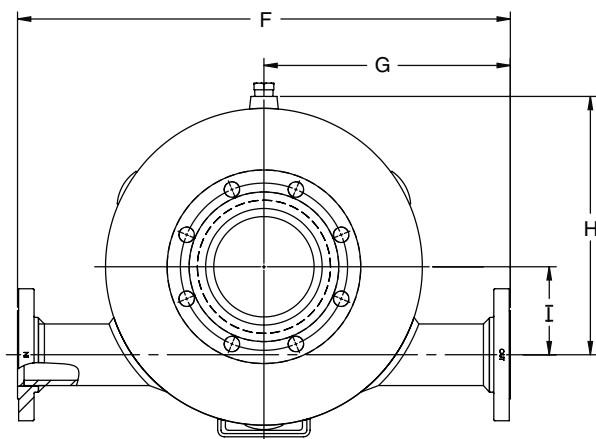
Inches (mm)



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)

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

**Drain Opening: 3/4"**  
**Flanges: ASME B16.5**  
**Air Release Flange: 6" Cl. 150**



## Modeling

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

### Type

VAR - Vertical Air Eliminator

### Flange Size

3 - 3"

4 - 4"

### Design Code\*

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 – Dual Solenoid, Triple Float Configuration

### Connections/Pressure Rating\*\*

3 – 150# RF/285 psig (1,965 kPa)

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

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

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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.

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