

The **Smith Meter™ Model DE-3 Air Release Head** is an electric float switch device for installation on an air eliminator tank.

The triple float switch air release head provides a unique method of air elimination designed to function with an unloading Petro-gard system. The elimination of air from the product is essential for accurate metering. The DE-3 is used in conjunction with the AccuLoad II¹ controller that operates the control valve, air eliminator solenoid, and pumps. With the probability of a large slug of air at the beginning and end of the batch, and possible entrapped air during the batch, the operation of the air release head functions to remove the air as it accumulates in the tank. The three float switches suspended at different levels in the tank sense the level of fluid and perform the appropriate functions as programmed in the AccuLoad II.

Please refer to Bulletin SS06014A1 "AccuLoad II - SEP/SMX" for operational features for the Petro-gard system.

The DE-3 Head is intended to be used in metering systems where air entrapped in the product is particularly troublesome (e.g., pumping off tank trucks and barges).

Features

- **Efficient Air Elimination** - Performs under a wide range of operating conditions.
- **Hazardous Areas** - Suitable for use in NEC Class I, Group D, Division 1².
- **Optional Downstream Venting** - Eliminates need for a "spit can" and hazardous or undesirable vapors from escaping into the atmosphere.

Principle of Operation³

The Smith Model DE-3 Air Release Head is designed to be used in conjunction with a Petro-gard system. A zero flow time is programmed into the controller. When the batch is started, the main pump is turned on and product starts to fill the system and the controller monitors the lower float switch. The control valve remains closed to allow the air eliminator solenoid to vent the initial slug of air from the tank.

The vented air may be plumbed back into the flow, downstream of the meter, to eliminate the need for a "spit can". A sight glass is incorporated in the DE-3 plumbing to assure that the product is not bypassing the meter.

As the fluid level rises in the tank the zero flow timer



counts down. If the lower float switch is not activated by the incoming fluid within the count down time, the batch is stopped. When the lower float switch is activated within the zero flow count down, the control valve is opened, low flow is initiated and the gear pump is turned on. The controller then monitors the flow switches to ensure that the product selected is the product flowing.

As the tank fills with product and air is vented through the eliminator solenoid, the middle and the upper float switches are monitored. Once the middle and the upper float switches are activated the controller will initiate high flow. If during the batch entrapped air in the fluid accumulates in the tank so the fluid level drops below the upper and the middle float switches, the controller will signal the control valve to lower the flow rate and the air will be vented. The low flow rate will remain until the air is vented and the middle and the upper float switches are raised, at that time high flow will be returned to resume delivery of the batch.

At the end of the batch the fluid level in the tank will lower as a large slug of air accumulates in the tank. As the air accumulates the upper and the middle floats will drop initiating low flow. The delivery will continue at low flow until the level in the tank drops to the lower float switch. When the lower float drops the controller turns off the main pump and starts the drain gear pump count down timer to deliver the remainder of the batch. The gear pump is plumbed so it will evacuate the residual product still in the tank and system. When the count down timer for the gear pump ends the control valve is signaled to close and the gear pump is turned off.

¹ Consult factory for use with AccuLoad III.

² Since power must be present at the reed switches in the float stem within the vessel, damage to the stem could cause a short circuit. Danger of an explosion is eliminated by the use of safety barriers, which limit the current below the level where incendiary sparking can occur.

³ The principle of operation described is only one of the possible sequences of operation available with the AccuLoad II.

Specifications

Viscosity

Up to 45 mPa·s⁴ (200 SSU).
Consult factory for higher viscosities.

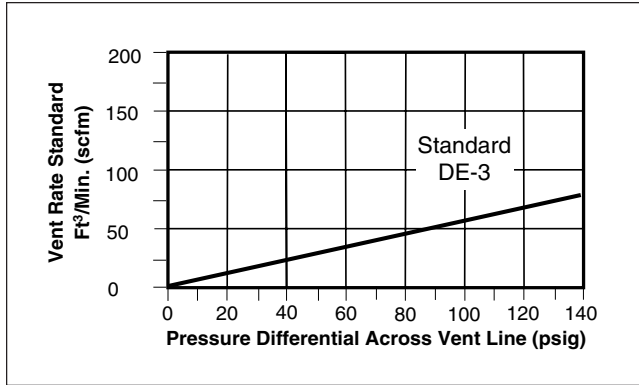
Recommended Product Specific Gravity

0.86 or greater.

Pressure Rating

150 psi (1,034 kPa) maximum working pressure with 316 stainless steel floats and standard solenoid.

Air Vent Rate



Temperature Range

-20°F to 300°F (-29°C to 149°C).

For other temperatures, consult factory.

Power Requirements

Voltage:

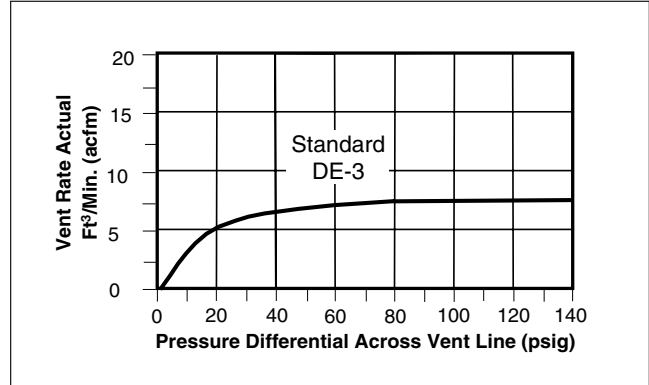
Standard: 120 Vac +0%–15%, 50/60 Hz.

Optional: 240 Vac +0%–15%, 50/60 Hz.

For other voltages, consult factory.

Weight

20 lb (9.1 kg.).



Materials of Construction (Wetted Parts)

Model	Type	Float Assembly	Mounting Plate	Tubing & Fittings/ Pilot Valves	Solenoid Valves ⁵	Sight Gauge
DE-3	Standard	316 S.S.	Carbon Steel	Carbon Steel/Viton	300/400 S.S./Viton	Bronze

⁴ 1,000 mPa·s = 1,000 cP = 1 Pa·s.

⁵ Consult factory for alternate materials.

Current Models

DE-3 — C — 2 — 1
 DE-3 — C — 2 — 2
 DE-3 — C — 4 — 1
 DE-3 — CF — 2 — 3

Type

DE-3 - Triple Float Configuration

Mounting Plate/Material

C - Standard Smith/"RB" Bolt Circle/Carbon Steel
 CF - Standard Smith/"RB" Bolt Circle/Carbon Steel/
 FIC-3/Special Plumbing Vent

Voltage

1 - 120 Vac 50/60 Hz
 2 - 240 Vac 50/60 Hz
 3 - 120 Vac 50/60 Hz (Class H Coil)

Float Assembly / Solenoid

2 - 316 Stainless Steel Float with Brass Stem /
 Stainless Steel Solenoid; for 4" Air Eliminator
 4 - 316 Stainless Steel Float with Brass Stem /
 Stainless Steel Solenoid; for 3" Air Eliminator

Ordering Information

Operating Conditions	Liquid—Name and sp. gr., Maximum Viscosity, Temperature Range (Min./Max.), Maximum Operating Pressure.
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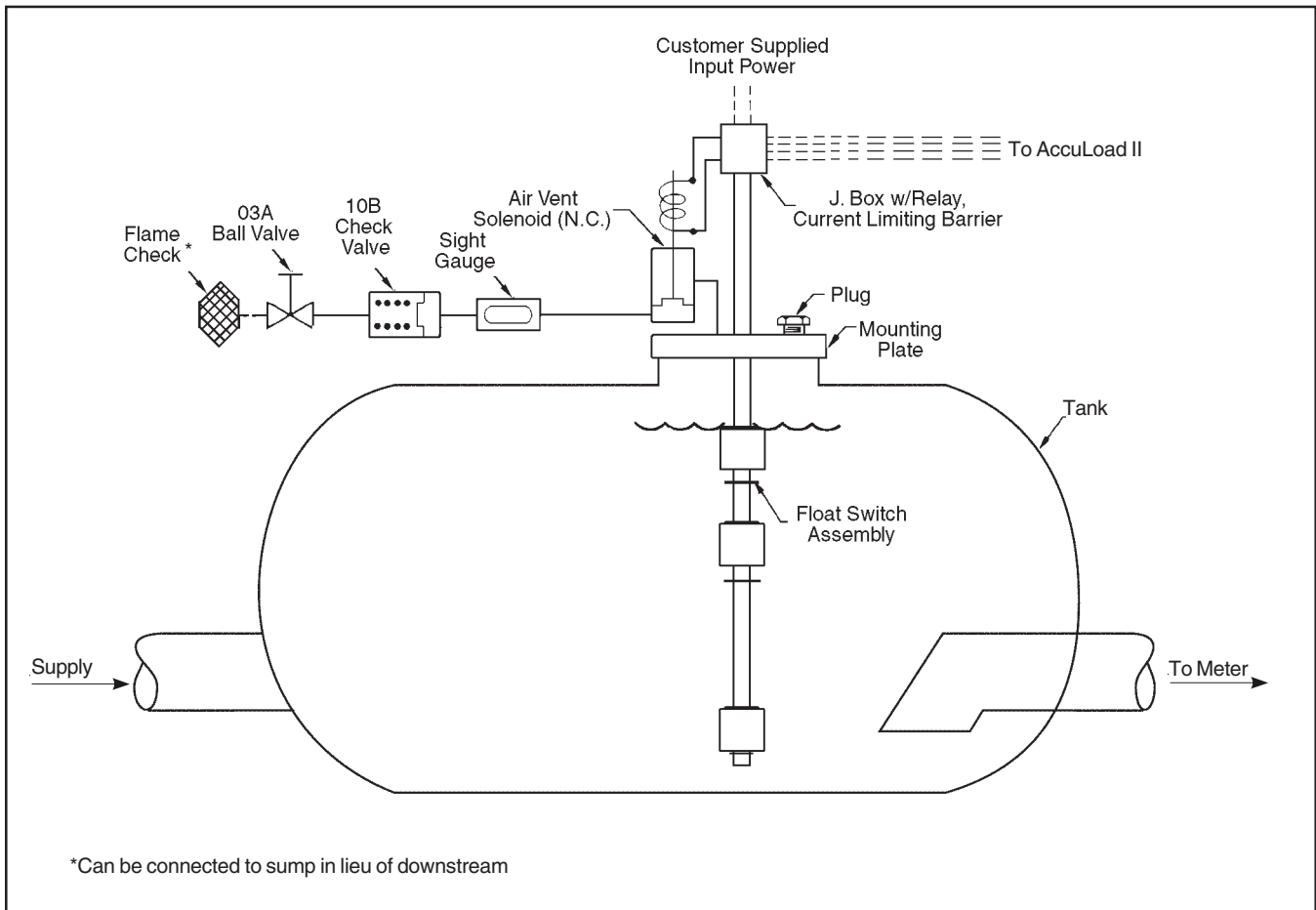
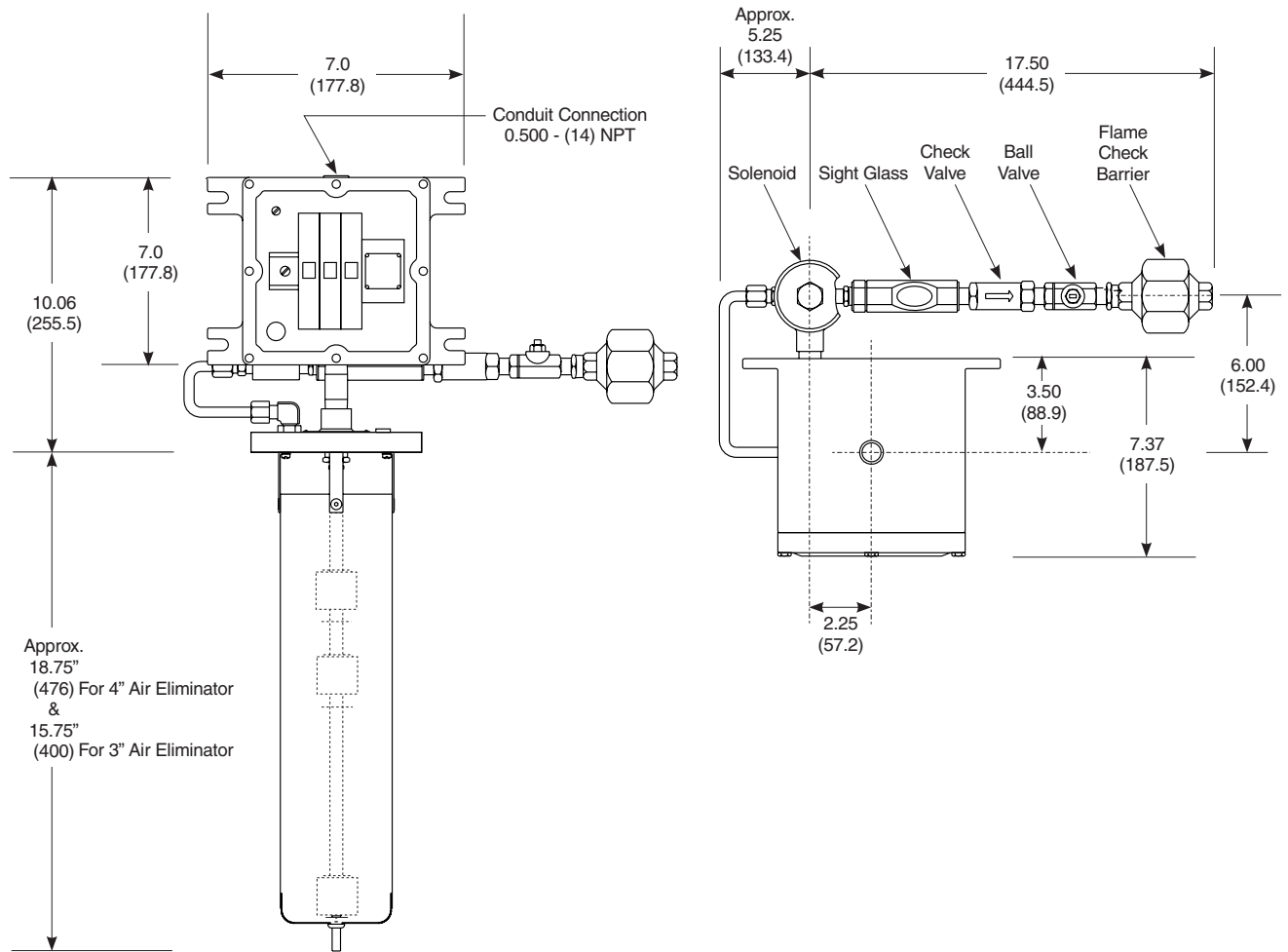


Figure 1 — Smith Meter™ Model DE-3 with Air Eliminator Tank

Dimensions

Inches (mm)



This is a complete revision and reassignment of Bulletin SS01098.

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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