

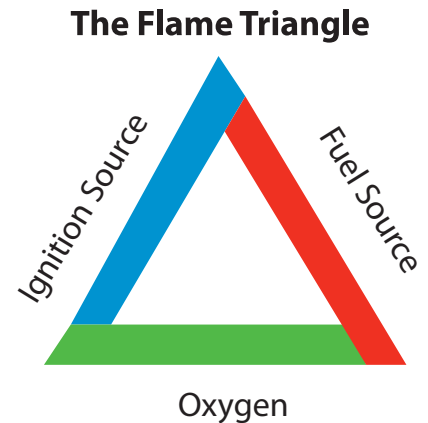
Safety Equipment In Methanol Systems



Primary Concerns with Methanol Systems

Methanol is a highly flammable substance with very specific material handling guidelines. When dealing with a substance whose ignitable temperature range is within normal storage conditions, safety is paramount. Shand & Jurs is proud to offer the industry's best, most innovative solutions to protect your product and your facility.

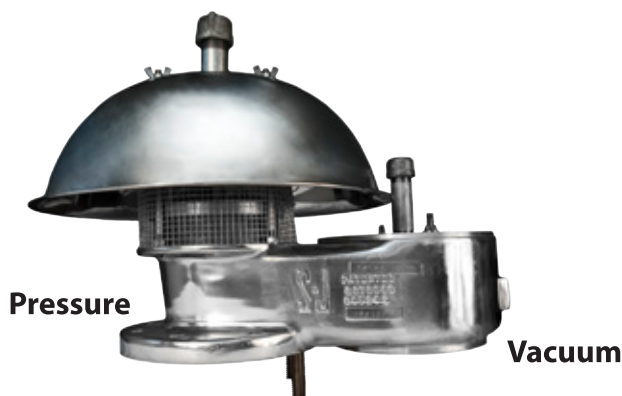
Since Methanol has a low flashpoint $< 100^{\circ}\text{F}$, approved safety equipment should be utilized. Shand & Jurs provides the necessary products to reduce Methanol emissions, and reduce the risk of flame exposure to the storage tanks and vapor collections systems.



Shand & Jurs Conservation Vents

The purpose of the Conservation Vent is to provide vacuum relief and normal pressure relief to accommodate product movement and expansion/contraction of the products thermal events.

Conservation Vents are also used where it is necessary or desirable to reduce tank emissions into the atmosphere. These vents are set to exact specifications so that the pallet assemblies in the housings open when specific pressure and vacuum levels are reached. The set points for these vents are achieved either by weight loading, spring loading of the pallet assemblies, or pilot operating depending on the setting required. The pressure/vacuum in the tank works in opposition to the force (weight or spring) applied to the pallet assemblies. Once the excess pressure or vacuum condition has been relieved, the pallet assemblies automatically reseal. Conservation Vents should be used in tandem with a Factory Mutual/ATEX approved Flame Arrester to prevent flashback into the tank from the ignition of the vent's relief stream (e.g. from lightning or some external spark).

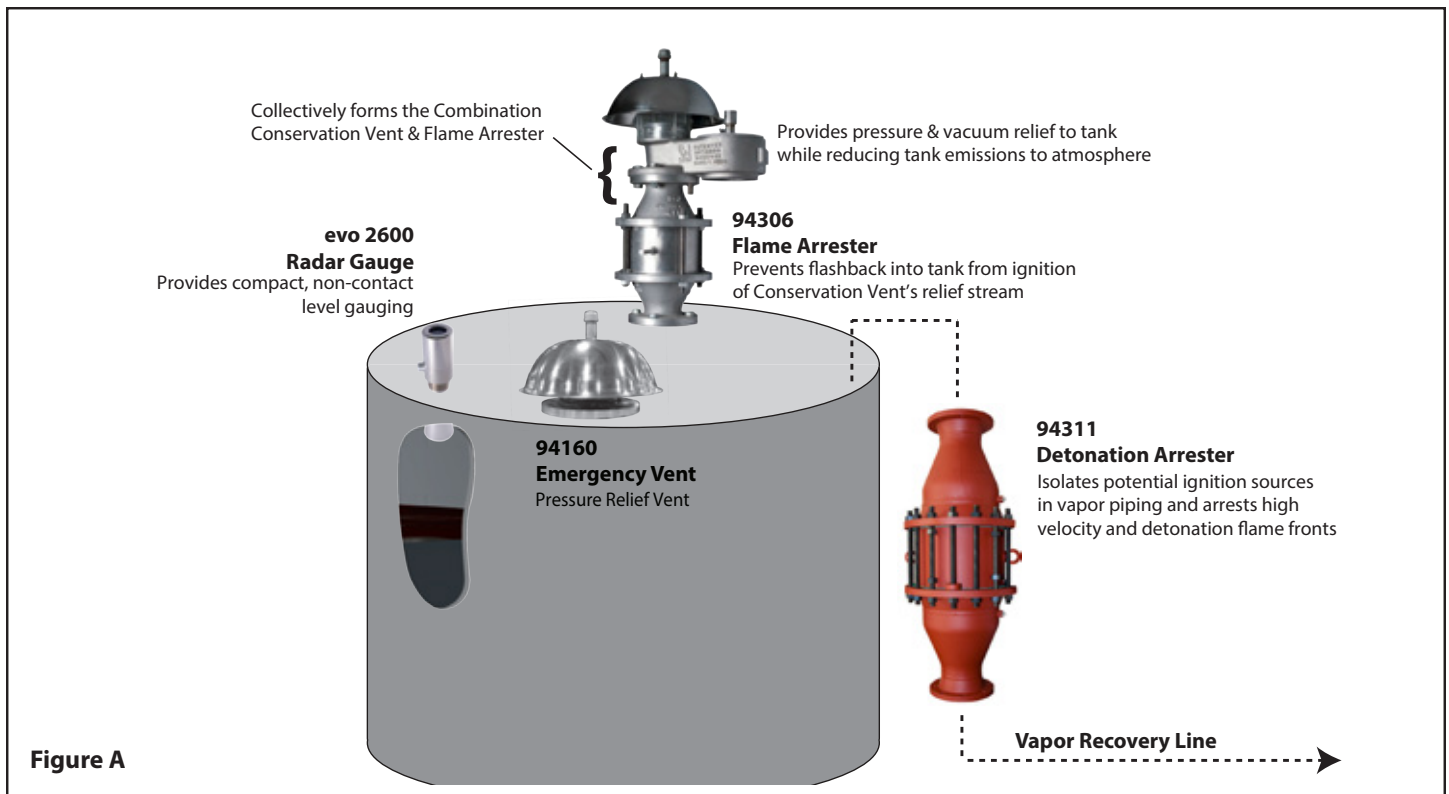


94020

Weight Loaded Conservation Vent

- Sizes 2" through 12"
- Provides Pressure and Vacuum Relief
- Options: Open Vent, Closed Vent and Limit Switch
- All-Weather Option
- Innovative "Expanda-Seal" Option
- CE & ATEX Approved

A typical methanol system is illustrated in Figure A on the next page.



Emergency Vents

The emergency vent provides supplemental pressure relief in emergency and fire case conditions. The set point should be set above the set pressure of the Conservation Vent and below the tank design pressure. The Emergency Vent serves as the Conservation Vent's backup. This extra contingency provides peace of mind about tank safety, is a relatively inexpensive way to avoid costly disasters and is often required by local fire codes and regulations.

94160 Pressure Relief Vent

- Designed for high efficiency & economy
- Provides maximum flow capacity
- Reduces maintenance and replacement costs
- Suitable for corrosive and toxic applications
- Standard flange base for 2", 3", 4", 6", 8", 10", 12", 16", 20" and 24" to fit 150 lb. ANSI flanges



Other emergency vent available options include: 94200, 94201, 94210, 94221 and 94225

Level Indication

L&J engineering's evo 2600 is a compact non-contact radar gauge that features K-band frequency which allows for concisely accurate readings and wider range of installation options. It also features an e.WAVE LCD display and e.Cal Intuitive Setup Wizard for simple startup and calibration.

Also available is the Liquid Level Indicator (92302) with optional MCG 2420 Transmitter or Automatic Tank Gauge (92021-92500) with optional MCG 2000MAX, both reliable float actuated level gauging systems which provide reliable and virtually trouble-free service for installation not requiring accuracies better than +/- 1 inch.

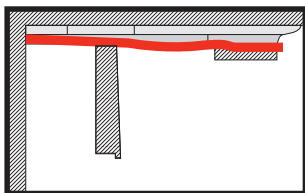
evo 2600 Radar Gauge

- 26GHz Frequency
- Accuracy of +/- 3mm
- FMCW Technology
- 4-20 mA Loop Powered
- e.WAVE LCD Graphical Display
- Features e.CAL Intuitive Setup Wizard for simple Startup and Calibration
- Lightweight
- Handheld infrared Calibration via Integral or Remote LCD Display
- Wireless Capability Available

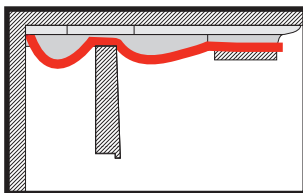


Expanda-Seal™

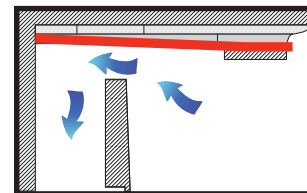
To reduce emissions, Shand & Jurs designed and patented a high performance valve sealing technology called Expanda-Seal™, which offers reduced tank emissions and odors for every process environment imaginable. This innovative design actually uses the internal vessel pressure to create a tighter seal the closer the pressure gets to the set point. Expanda-Seal™ ensures less than 0.5% SCFH air at 95% of the set point; the end result is a nearly bubble-tight seal.



When pressure inside the tank is below the set point, the deflated diaphragm rests on the seat ring in a typical manner, as with any normal valve, retaining internal pressure.



As the pressure approaches set point, the Expanda-Seal™ diaphragm inflates and wraps around the mating seat to achieve this unique sealing effect.



When the pressure in the tank is at or above set point, the valve lifts to relieve the overpressure.

Flame & Detonation Arresters

A flame arrester is designed to be used as a barrier between the tank and the vent to safeguard the tank contents from igniting if an outside ignition source is present. A detonation arrester isolates the potential ignition of vapors in closed piping systems to protect storage tanks and process units from detonation flame fronts.

9431x Series Detonation Flame Arrester

- Sizes 2" through 24"
- Provides Protection against Flame Propagation through Closed Piping Runs and Vapor Recovery Systems, while Allowing Maximum Flow Efficiencies
- Out Performs Other Flame Control Devices
- Virtually Indestructible Arrester Core Assembly
- Approved for Marine Applications – USCG Accepted & FM Approved
- NEC Group C & D Gases



94306/94406 Vertical Flame Arrester

- Sizes 2" through 12"
- Construction: Cast Aluminum, Cast Iron, Cast Steel, 316 SS
- Serves as a Barrier between External Flame and Internal Vapors
- Provides Protection Against Flash Back
- Optional Steam Jacketing Available
- FM & ATEX Approved

Other Safety Options

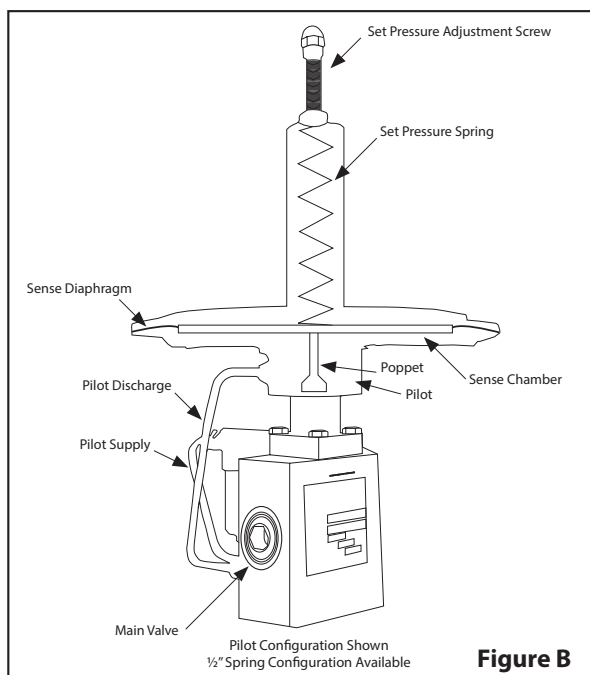
Another method of improving methanol storage safety is Tank Blanketing. The primary purpose of a tank blanketing system is to protect storage tanks from explosion and implosion during product movement or static conditions. In simple terms for a methanol system, a tank blanketing valve will replace oxygen in the tank with an inert gas, such as nitrogen, thereby reducing the risk of fire by breaking the oxygen leg of the flame triangle and preventing the product from oxidizing.

Typically, a tank blanketing valve (i.e., 94270) is installed on top of a storage tank along with a pressure/vacuum relief vent (i.e. 94020) and uses the supply of high pressure inert gas to maintain a “blanket” of low pressure gas above the product inside the tank. When pressure inside the tank falls below the valve’s set point, it opens and supplies gas to the vapor space and reseals as the pressure returns to the set point.

What is Tank Blanketing?

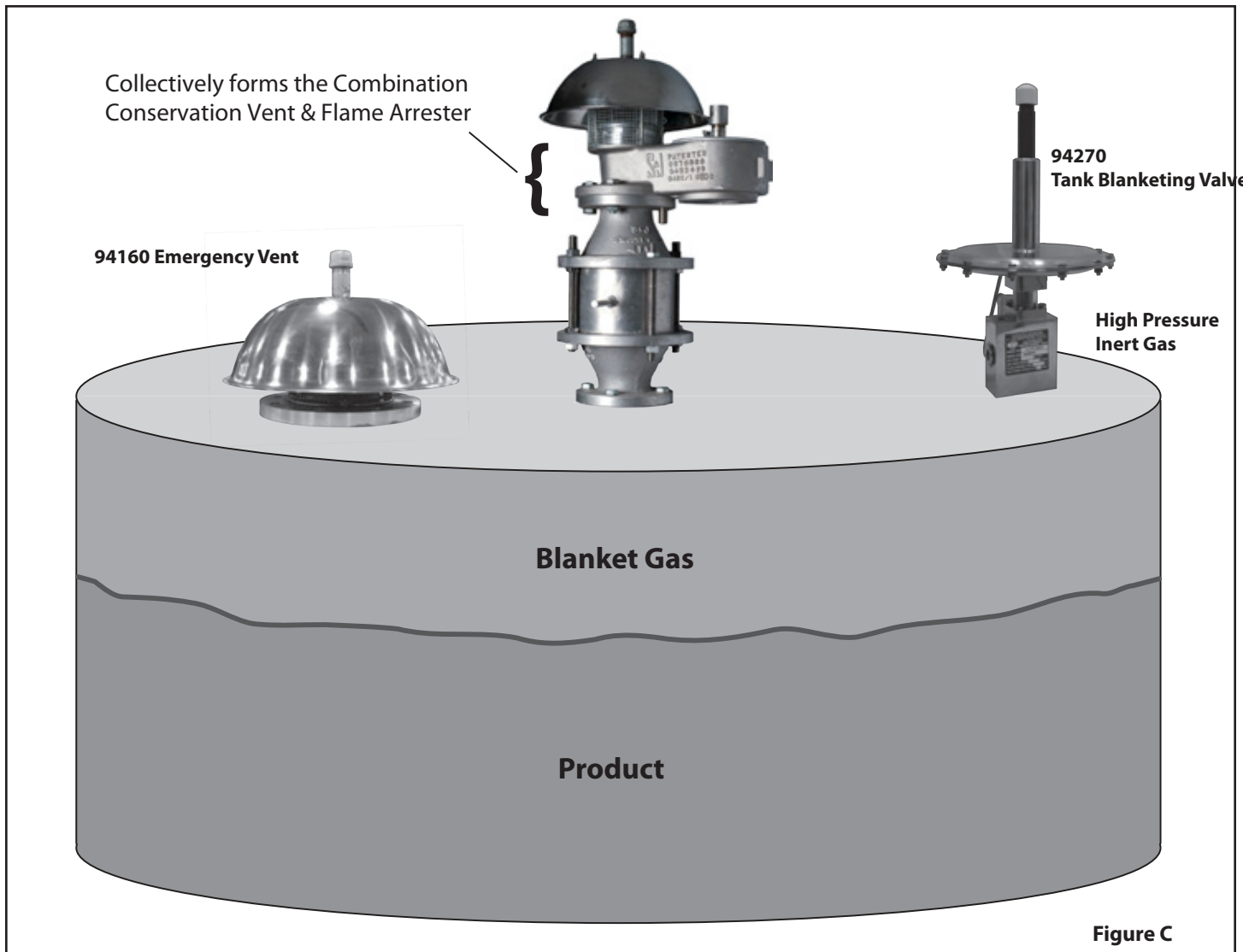
Tank Blanketing is a process used to maintain a gas barrier (typically Nitrogen) or “blanket” in the vapor space of a pressure-tight storage tank. It keeps the vapor space outside of the flammable range and prevents evaporation, reduces emissions, combustion potential, corrosion, contamination or oxidation and provides gas make-up when internal tank pressure drops.

The 94270 has a balanced, piston operated main valve so that the set point pressure is virtually unchanged at any given inlet pressure within the specified operating range. The “VAPOR GUARD” has a modulating type action valve that opens and closes automatically, maintaining a closely controlled blanket pressure and gas flow. The modulating action simplifies the valve design thus increasing reliability and reducing maintenance costs. The “VAPOR GUARD” operates in the closed position whenever the tank pressure is satisfied or exceeds the set pressure. Whenever the sensed pressure decreases, the set pressure spring and diaphragm assembly causes a downward force such that the main valve will open proportionately to control pressure and limited capacity.



94270 Tank Blanketing Valve

The main components of the 94270 Tank Blanketing Valve are illustrated in Figure B, and a typical Tank Blanketing System is illustrated in Figure C.



Shand & Jurs Tank Blanketing



94270 "Vapor-Guard" Tank Blanketing Valve

- 1/2", 1" and 2" Sizes
- 304 or 316SS Bodies
- 6 Flow Control Orifices
- Pressure Balanced Main Valve Design Ensuring Constant Settings
- Remote Sensing Permitting Choice of Pressure Sensing Location
- BUNA, Teflon, Viton, EPDM and Kalrez Seals Available

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Liquid Level Gauging,
 Temperature Detection &
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Liquid Level Switches



Point/Multi-Point Level Controls
 & Continuous Level Sensors



Tank Vents, Flame and
 Detonation Arresters,
 Fittings & FRP Equipment



Digester Gas Equipment
 Waste Gas Burners
 Flares



Mold Level & Strip
 Guiding Measurement
 & Control Systems for
 Metals/Steel Industries

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