



Ethylene Oxide Service

Ethylene Oxide is very flammable and explosive. It also is a carcinogen and could cause other major health problems such as nerve damage in low concentrations. Ethylene Oxide is also known to decompose at higher temperatures (842-1040°F) and this decomposition could produce runaway reactions. Although there are inherent dangers that are present for the production and handling of this molecule, Ethylene Oxide is very useful in production of detergents, cosmetics, and the sterilization of surgical equipment. Careful selection of materials of construction and characteristics of valves is imperative to sustain a safe, stable Ethylene Oxide system.

Vented Ball

Ethylene Oxide has a high coefficient of thermal expansion. If the Ethylene Oxide is trapped in a closed space, large pressures can develop that can be destructive. The vapor pressure of Ethylene Oxide is shown on the next page. A-T Controls provides a means of relieving this pressure in floating ball valves by venting the ball in the upstream direction. This limits the valve to one direction flow and an arrow on the valve shows which direction the valve should be installed. **A vented, upstream ball is required for floating ball valves for Ethylene Oxide service. For bi-directional service, a trunnion mounted ball valve (TS2 or TS3 Series) with SPE (Single Piston Effect) or DPE (Double Piston Effect) with a pressure relief valve must be used.**

Cleaning and Lubrication

The reactivity of Ethylene Oxide makes removal of materials that can react with Ethylene Oxide such as organic residues and metal oxides imperative. Compatible lubricants are required for the construction of the valves. Water should be removed from the valve to avoid strong exothermic reactions at room temperature.

Standard Material

Please consult A-T Controls for material selection for your application. These parameters are guidelines, and customers are responsible for materials of construction, preparation of the valves for service, and lubricants being compatible with their Ethylene Oxide application:

Auxiliary Stem Seal: Grafoil®, PTFE, FFKM o-ring (Viton® susceptible to chemical attack).

Body: 316 SST/CF8M, Carbon Steel, Hastelloy® C-276

Seats: TFM-1600® (recommended for low temperature applications), PTFE (Teflon®), RTFE, 50/50 STFE

Trim: 316 SST, 304 SST (slight corrosion)

Valve Packages

Series D9- Sizes 1/2"-6", 150# and 300# ANSI, Full Port Design, ISO5211 Actuator Mounting Pad, Anti-Static Device, Traceable Valve

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Series F88- Sizes 1/4"-4", Full Port, Direct Mounting Pad, Threaded, Socket Weld, or Butt Weld

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Series TS2 (cast)/TS3 (forged)- Sizes 2" – 48", Full and Reduced Port, Class 150/300/600, multiple end connections and body materials/trim materials available.

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Vapor Pressure vs. Temperature Ethylene Oxide

