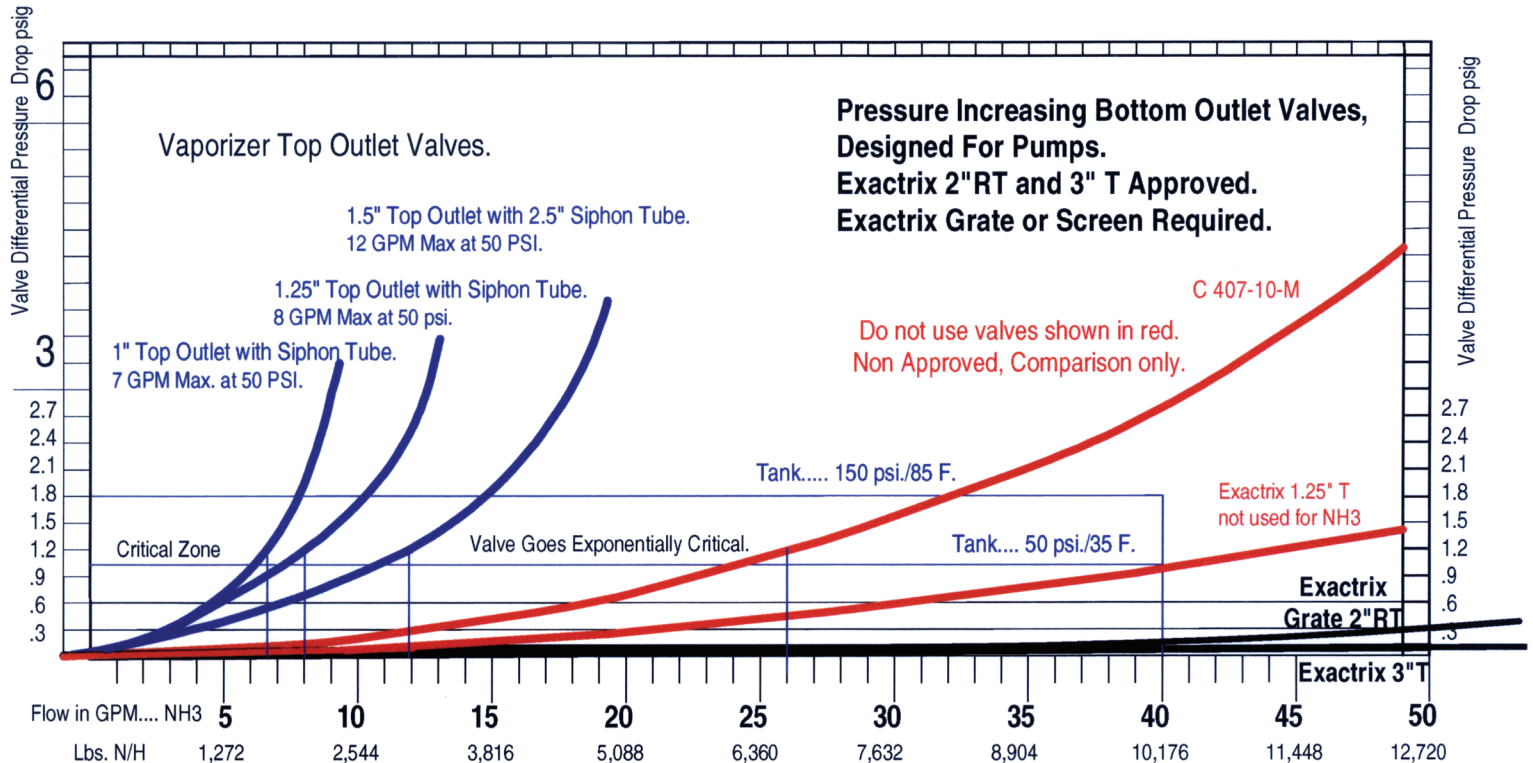


## Comparing 3 top outlet vaporizer valves with siphon tubes to 4 bottom outlet valves for pumps.



Note 1: At 150 psi tank pressure there is more heat of vaporization at a 7% less mass flow compared to 50 psi tank pressure. The valve function varies with changes in mass flow or bulk density. At 50 psi tank pressure the temperature is 35°F at 39.72 lbs/cu.ft. At 150 psi tank pressure the temperature is 85°F at 37.18 lbs/cu.ft. Exactrix bottom outlet valve arrangements have proven to produce excellent flow values at 0° F application temperatures.

Note 2: At 150 psi tank pressure there is greater BTU value or heat of vaporization for the Phase Shifter. Vaporizer flow also increases 1.73 times. An additional 1 to 2 gpm of liquid flow is available at 150 psi compared to 50 psi. Below 50 psi or 35 degrees F the top outlet valves reduce flow about 1 gpm per 5 degrees of temperature drop.

Note 3: Good supply system designs must include the pressure drop of the hose end valve and the Smarthose Breakaway. NPSH is required to the pump. NH3 is pushed out of the tank.....pumps can not suck NH3. Four feet of tank differential is required to the pump inlet to completely empty the tank and maintain ground speed. Tank differential is measured from the bottom of the tank to the inlet of the pump.

Note 4: With proper supply side components a Phase Shifter or cooler is not required. The Exactrix systems are engineered to deliver liquid NH3 to the pump inlet.

Twin tank, Top outlet valves: 1 inch valves, 1.33" thread diameter, 14 gpm, 1.25 inch valves, 1.66" thread diameter, 16 gpm, 1.5 inch valves, 1.9" thread diameter, 24 gpm. Twin tanks must be connected with two Smarthose breakaways, two Exactrix approved A-215 L hose end valves and a Exactrix inlet consolidator.

Two valves qualify for bottom outlet service for agricultural NH3 application. Three arrangements qualify. Liquid delivery is assured based on the above flow charts and proper Exactrix engine mounting. Follow Exactrix engine mounting procedures. Exactrix engines are always mounted below the bottom of the tank. Raise the tank or lower the Exactrix engine for proper NPSH. Never mount the Exactrix engine above the bottom of the tank. Size supply side components

.....The Exactrix 2" RT Grate Valve is utilized with dual 1,000 gallon tanks with 41" bulk heads. The Exactrix 2" RT requires a 3" diameter cut hole in the tank. R-Stamp welding is required. Maximum flows are acceptable to 50 gallons per minute. Nominal flow is 20 gpm. Dual tanks are required to assure 40 gpm delivery under all conditions. Redundant or dual tank delivery is required due to size of the tank bulkhead. R stamp welding required....No alteration or calculations required.

.....The Exactrix 3" T Grate Valve is a similar to the 2" RT Grate design. Rated at 80 gallons per minute. R and A welding and calculations are required.

.....The Exactrix 3" T is utilized with single 1,450 to 2,000 gallon tanks with 48" bulkheads. The Exactrix 3" T requires a 1.5" base plate in an altered tank. R and A Stamp welding and calculations required. Flows are generally acceptable to 80 gallons per minute. Single tank supply is acceptable for most conditions. Redundant tank delivery with twin 1,450 tanks and twin 2,000 tanks has proven superior over single tanks.

Disqualified Valves: The C 407-10-M does not have a 90 degree outlet and the Exactrix 1.25" T is high maintenance valve with annual replacement parts required. . The 1.25" T is a very difficult valve to set. The valve is no longer offered for NH3 service.

Exactrix Bottom Outlet Valves require guarding meeting Indiana Ammonia Laws which has become the a standard for Exactrix. Therefore Exactrix valve guard designs meet or exceed all state and ANSI standards to our current knowledge. Welding and modification meeting Division 8 National Board of Review. Hartford Insurance has reviewed Exactrix modifications. Exactrix engineering has reviewed with the appropriate authorities or will review upon request of various state boiler inspectors.