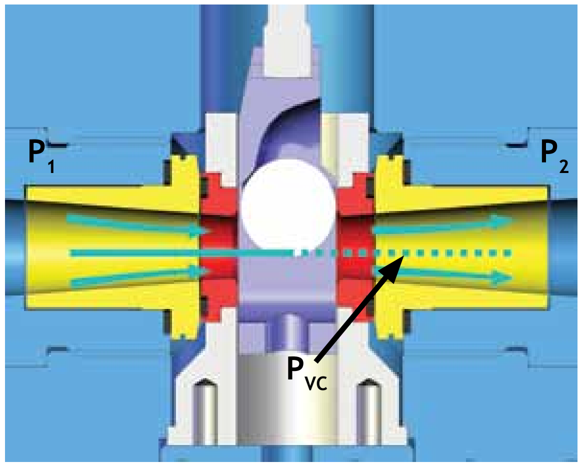
Cavitation Control

Using the illustration below, at P_1 the fluid stream is all liquid. Liquid flashes at the valve port when the pressure at the vena contracta (P_{VC}) drops below the liquid vapor pressure. As the velocity decreases in the exit nozzle, the pressure increases (or recovers) to P_2 and the vapor bubbles collapse. This is known as the potentially damaging phenomena called cavitation. Unlike tortuous path valves, our control valves manage cavitation. Bubbles form at the lowest pressure (highest velocity) which is at the center of the fluid stream. The subsequent collapse is within the hydraulic barrier, not on metal surfaces. Our nozzle design provides a smooth recovery prior to the fluid exiting the valve.



Bernoulli

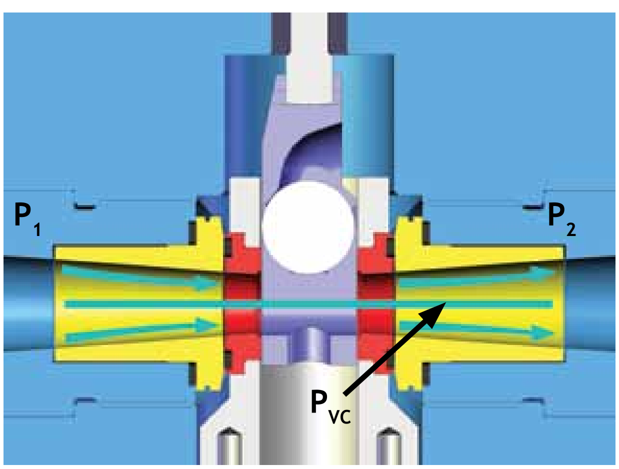
The Bernoulli Principle

Energy per unit volume at inlet = Energy per unit volume at outlet

$$P_1 + 1/2\,\rho v_1^2 + \rho g h_1 = P_2 + 1/2\,\rho v_2^2 + \rho g h_2$$

Where: P = Pressure Energy; $1/2\,\rho v^2$ = Kinetic Energy; $\rho g h_1$ = Potential Energy

The best example of the Bernoulli Principle is often called the "Bernoulli Effect" which states that fluid pressure decreases as fluid velocity increases.



The illustration shows the typical change in pressure as the fluid moves through the valve. At inlet, the pressure is P_1. Velocity increases through the valve to a maximum as it moves through the valve port. At the valve port, the pressure drops to P_{VC} (pressure at the vena contracta), which is the lowest pressure in the valve. As the fluid exits the valve, pressure recovers to P_2 which is lower than P_1.

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