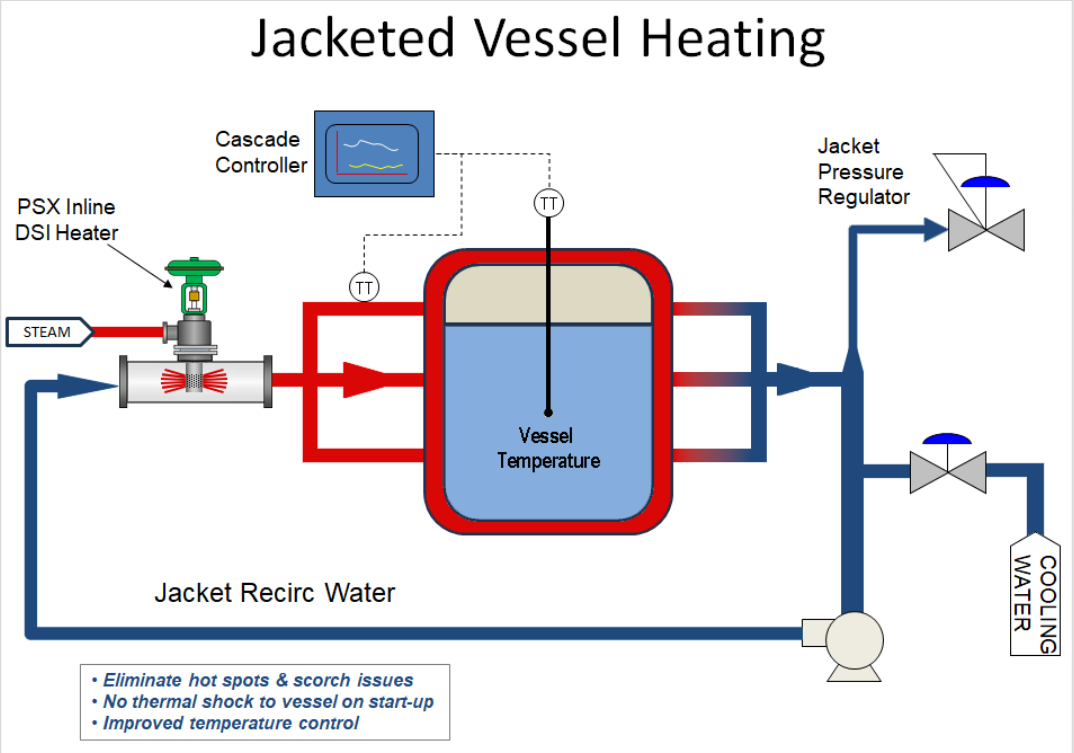
Application: Jacketed Vessel Heating for Food and Chemical Industries



Heating and cooling of jacketed vessels is a critical process across both the food and chemical industries, enabling precise temperature control for a wide range of products and reactions. Jacketed vessels are used when direct heating of the vessel contents is not feasible, either to protect scorch-sensitive food products like soups, sauces, and beverages, or to carefully manage chemical reactions that require controlled thermal conditions.

Typically, steam is introduced into the vessel jacket to provide the necessary heat for processing. Water or other heat transfer fluids (such as glycol or thermal oil) may also be used for both heating and cooling cycles. Many processes utilize controlled ramp-up scenarios to stage heating and often include a cool-down stage to return vessel contents to safe handling temperatures.

However, the use of live steam in the jacket can sometimes result in hot spots and, in some cases, thermal shock, which may damage welds on steel tanks or crack glass vessels.

PSX Heater Solution

A ProSonix (PSX) direct steam injection heater can be integrated into the heat/cool recirculation loop to instantaneously heat the water or heat transfer fluid to the required temperature. The PSX heater efficiently handles water flow rates from 1-2,000 GPM and can heat incoming water from 1-250°F in a single pass, with precise temperature control to within ±1°F.

Instantaneous heating allows for precise, controllable ramp-up of temperatures, improving process control in both food and chemical applications. During the cooling cycle, the PSX steam injector simply closes, allowing the cooling fluid to circulate through the system without interruption or the need to vent the jacket prior to cooling.

Key Benefits of ProSonix Direct Steam Injection

- **Precise Temperature Control**: Enables accurate and consistent heating—ideal for sensitive food products and controlled chemical reactions.
- **Uniform Heating**: Reduces hot spots, improving product quality and reaction consistency.
- **Reduced Maintenance**: Eliminates thermal shock by using hot water rather than live steam, protecting vessel integrity.
- **Noise & Vibration Elimination**: Minimizes operational noise and water hammer.
- **Ease of Integration**: Compatible with cascade heating control systems and easily managed via plant PLC/DCS or local controllers.
- **Instant Transition**: Seamless switch between heating and cooling to minimize process upsets.
- **Compact Design**: Minimal installation requirements due to the small footprint of the PSX heater.

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