

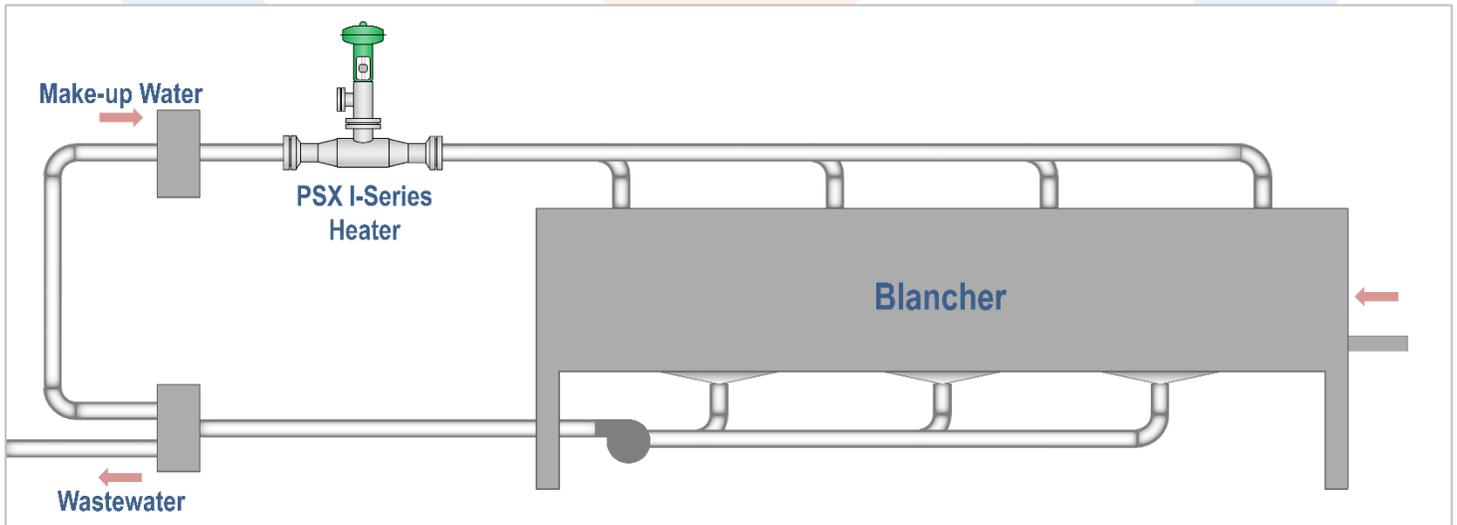
Application Profile: Vegetable, Fruit & Potato Blanching

Blanching is a short, controlled thermal step used to inactivate enzymes in vegetables and potatoes before freezing, canning, dehydration, or further processing. Product is exposed to hot water or steam, then rapidly cooled to stop cooking. Typical blancher supply temperature is **190–205°F (88–96 °C)**, and tight temperature control is critical for consistent texture, color, and shelf life.

Blanching loads change quickly with line speed, belt or auger loading, water flow, and whether the product is fresh or frozen. These load shifts can occur multiple times per day, so the heating system must react immediately and maintain a constant blancher inlet temperature without overshoot or instability. Stable blancher temperature also protects downstream cooling and reduces overcooking risk. Consistent water temperature through the entire blancher is critical for optimal product quality.

Limitations of Conventional Heating

- **Heat exchangers** (shell-and-tube or plate) have slow response due to thermal mass, require floor space and cleaning, and add pressure drop that increases pump demand and can affect spray performance.
- **Mechanical steam spargers** often provide uneven steam distribution and are prone to fouling or plugging in systems with minerals or product fines.
- **Conventional steam injection with external control valves** throttle pressure upstream instead of controlling steam flow at the mixing point, leading to temperature swings, steam hammer, vibration, and noise under variable load.



ProSonix Inline Direct Steam Injection

ProSonix inline heaters control **steam mass flow directly at the mixing point**. A pneumatic actuator positions a variable-area diffuser; steam passes through an engineered nozzle at sonic velocity (choked flow), creating a repeatable relationship between stem position and steam flow. The result is fast, stable temperature response during changing blancher loads—without relying on external PRVs.

High-velocity steam injection maximizes condensation efficiency and eliminates the vibration and hammer issues common with traditional spargers and non-choked injection designs.

Key Benefits for Blanching with ProSonix DSI Heaters

- Precise blancher water temperature control (typically $\pm 1^\circ\text{F}$) through rapid load swings and fresh/frozen transitions
- Wide turndown on steam and water flow for stable performance across all production conditions
- Effective operation with lower-pressure steam without a dedicated PRV
- Self-cleaning design that resists scaling and reduces maintenance
- Very low water pressure drop (typically **1–2 psig**) to reduce energy costs and enable stable spray performance
- Compact inline installation that fits easily into existing blancher supply lines and control loops

ProSonix direct steam injection heaters deliver the tight control, responsiveness, and reliability needed to maintain consistent blanching temperature while minimizing downtime and maintenance.