



Fig. 1 – Typical CIP Hot Water System Loop

Application: Hot Water for Clean-in-place (CIP) systems

Clean-in-place (CIP) is a method of cleaning the interior surfaces of pipes, vessels, process equipment, filters and associated fittings, without disassembly. The advent of CIP is critical to industries that need frequent internal cleaning of their processes. Industries that rely heavily on CIP are those requiring high levels of hygiene, and include dairy, beverage, brewing, processed foods, pharmaceutical, and cosmetics.

The benefit to industries that use CIP is that the cleaning is faster, less labor-intensive and more repeatable, and poses less of a chemical exposure risk to people. These systems can operate either in a single pass with used CIP hot water going to drain, or a recirculated system with CIP hot water returning to a central tank system.

Challenges Associated with CIP Systems

- Hot water temperature recovery time as CIP system hits peak conditions, variable hot water demand, or for start-up.
- Temperature control is critical to issue proper sanitation. Meeting cleaning requirements with required hot water temperature is often recorded for sanitary system requirement standards.
- Equipment reliability to handle intermittent operation, water & steam turn down, & aggressive cleaning solutions.

ProSonix Direct Steam Injection Heater Solution

The ProSonix (PSX) steam injection heater is well suited for intermittent operation and on-demand hot water required to heat the CIP water. The key to efficient, safe, and predictable steam injection is the use of Internally Modulated steam control to inject steam at sonic velocity to achieve choked flow. With choked flow, sonic velocity conditions are achieved for steam injection. The ProSonix Heater uses an integral pneumatic actuator to maintain sonic velocity steam injection for good, non-violent mixing across the entire operating range. The PSX heater is an internally modulated heater, with a variable position stem plug, that varies the mass flow rate of steam by changing the area through which the steam may pass. This type of modulation allows the full steam pressure to always be present at the point of injection regardless of plug position.

Key PSX Heater Steam Injection Heater Benefits

- **High Turndown** – 100% turndown on steam and up to 8:1 on liquid.
- **Precise temperature control** – Maintain +/- 1 deg F temperature control for CIP hot water cycle
- **System stability** – no surging from single jet eductor style heater or heating lag response from heat exchanger
- **Quiet Operation** – Elimination of steam hammer & vibration associated with eductor style heater
- **Faster Start-up & Recovery** – PSX Heater come online at desired CIP temps rapidly eliminating wash delays & faster recovery at peak CIP wash times

For additional information, please visit www.pro-sonix.com.