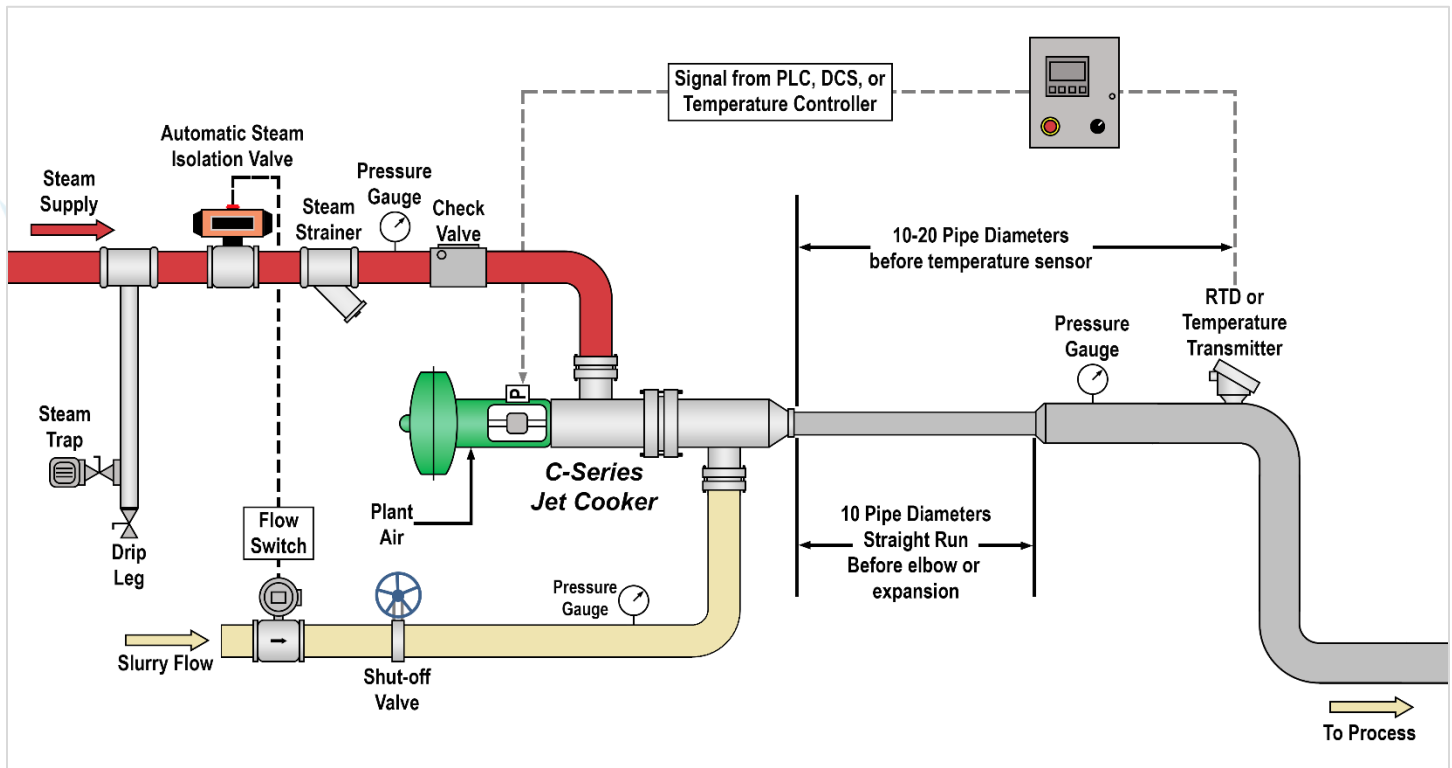


PSX Technical Bulletin



Jet Cooker Process and Installation Recommendations:

- **Steam Pressure** – Steam supply pressure should be stable. If the steam supply varies by more than +/- 10% of the design pressure, a pressure regulating valve should be installed to stabilize steam pressure. A loss of steam pressure or spikes in steam pressure can cause unstable operation.
- **Fluid Pressure** – The liquid pressure cannot exceed the max backpressure listed on the PSX heater sizing worksheet to ensure stable operation.
- **Pump** – The fluid or slurry pump should operate with a steady output flow to maintain continuous flow to the PSX heater.
- The PSX steam inlet can be rotated 360° to meet the incoming steam line. Specific steam inlet positioning is based on the flange bolt arrangement.
- A steam trap and strainer are recommended on the incoming steam line.
- The PSX heater can be mounted in any orientation. An vertical installation with the actuator below the heater is not recommended, as the actuator will become a drip point.
- The RTD and temperature switch should be placed downstream of the ProSonix heater, no more than 20 pipe diameters after the discharge of the PSX heater.
- A minimum of 10 pipe diameters of straight smooth pipe is required after the heater before any instrument, elbow, or valve installation.
- Verify proper pipe supports to independently support the piping from the heater, and then the heater independently from the piping. **Do Not** support the actuator independently from the heater.
- Placement near a pump needs to be reviewed to allow for fully developed flow or avoid suction issues.
- Please refer to the ProSonix heater Owner's Manual for complete installation and safety details.

Steam Strainer Sizing Guidelines (inches)			
Heater Steam Inlet	Max. Opening	Heater Steam Inlet	Max. Opening
1.0	0.030	4.0	0.063
1.5	0.030	6.0	0.063
2.0	0.030	8.0	0.063
3.0	0.030	10.0	0.125

Temperature Loop & Steam/Liquid Piping Components:

Temperature Probe The temperature probe is a vital element in successfully controlling the PSX heater. The PSX heater will typically be among the fastest responding elements in the control system. As such, it is vital that the temperature response from the probe be as fast as possible. The following recommendations will apply to most installations:

1. Place the probe in a location where it will see well-established flow.
2. Place the probe no more than 20 pipe diameters from the PSX heater.
3. Use reduced-tip thermo-wells or bare sensors if the system allows them.
4. RTDs or thermocouples may be used.
5. Temperature transmitters, if used, should be designed to fail at high-temperature output to prevent the heater from overheating the process upon failure.

Steam Traps & Blow Down Steam will cool and condense in the pipe during normal operation. A well-insulated pipe will minimize this effect. The condensed steam travels at high velocity and may cause damage to the PSX heater or steam piping. Condensate may be removed using a device known as a steam trap. A valve may also be used to purge water from a low spot in the pipe.

1. A steam trap and drop leg with a blow-down valve should be installed on the steam inlet piping, upstream of the check valve.
2. Steam piping should be blown down after any extended shutdown to ensure all condensate has been purged from the steam line. Install a trap in the steam supply line close to the PSX heater to remove any condensate before it can cause noise and vibration in the PSX heater.

Steam Isolation Valve Because the PSX heater is not a positive shutoff valve, a full-port tight shutoff isolation (on/off) valve should be used to provide complete shutoff of steam during extended downtime or for PSX heater maintenance. A full port ball or butterfly valve, sized for low-pressure drop, is recommended. The isolation valves should be closed to isolate the supply line from the PSX heater when the PSX heater is not in operation for an extended period.

Check Valve A check valve should be placed approximately 5 pipe diameters from the PSX heater steam inlet. The check valve should be sized appropriately for minimal pressure drop into the heater. During times of PSX heater shutdown, if water pressure is maintained in the PSX heater, the water will flood the steam piping if no check valve is present. Upon opening the steam block valve when restarting the system, steam hammer may occur in the inlet piping.

Flow Switch A flow switch is necessary when there is intermittent flow or there is a risk of loss of flow. If a flow meter is already present in the system, the flow signal can be used as a means of detecting low-flow conditions and shutting down the heater and closing the steam valve. Simply program a low-flow switch into the control system. If there is a pump supplying the water and there is little fear of loss of supply to the pump, a switch on the pump motor or VFD can also provide low-flow protection. A flow switch is the most reliable way of protecting the system from a low-flow condition. A thermal flow switch such as the Ameritrol FX series, or an IFM Efector SI series, has no moving parts and provides good protection.

Note: The above-referenced components are not included with the PSX heater unless otherwise stated in the proposal. Please refer to the ProSonix O&M manual for complete guidelines for use.