

## **ProSonix™ Pilot Lab Jet Cooker for Direct Steam Injection Of Starch Slurries**

### OptiShear™ Pilot Lab Jet Cooker

- **Sonic velocity steam** injection via internal steam modulation provides stable and vibration free operation.
- **Flowrate:** 0.25 – 3.0 gpm
- **Precise temperature control** to +/- 1°F for reliable heating performance.
- **Compact design** suitable for minimal installation space requirements.
- Well suited for **High Solids Concentration** starch slurries.
- Can be installed in any orientation.
- **High temperature rise** (up 250°F) in a single pass.
- Standard materials of construction are 316SS.
- **Wear Coatings** are available for erosive slurries applications.
- Standard NPT fittings for 150 psig steam.
- Designed to ASME B31.1



**ProSonix Pilot Lab Jet Cooker**

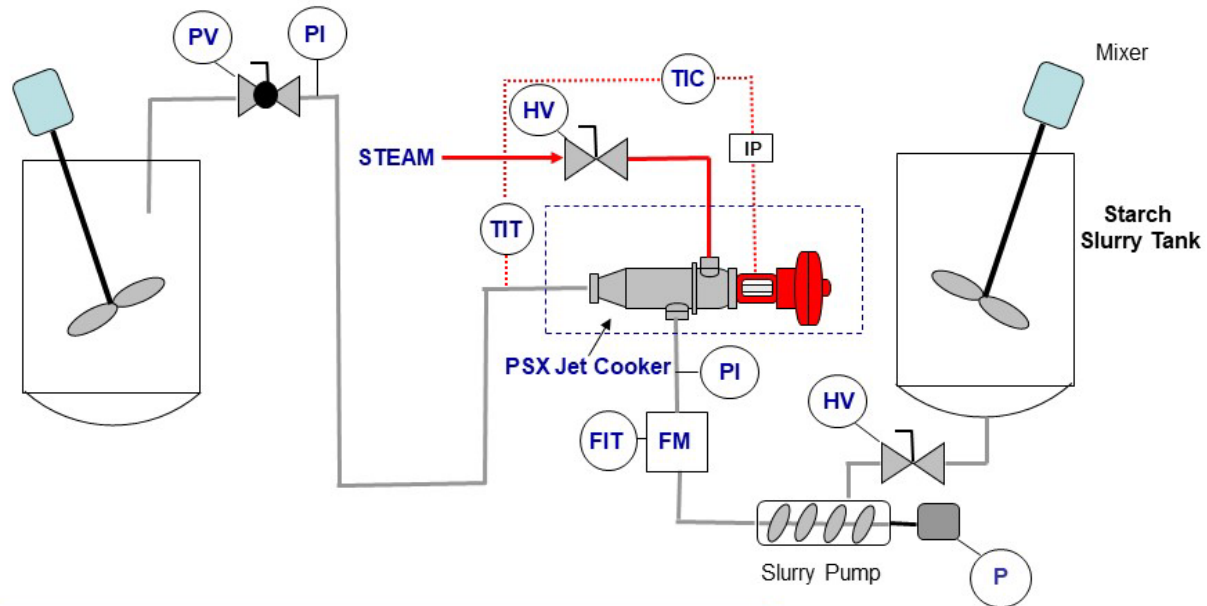
The **ProSonix™ PSX-38 Lab Jet Cooker** Direct Steam Injection heater is designed for Pilot Lab starch cooking applications. The **ProSonix™** unique method of direct steam injection utilizes **internal steam modulation** via an integral Pneumatic Actuator to accurately deliver the appropriate mass flow of steam for the required heating. This modulating design offers a precise method of steam control through a choked flow control delivery of the steam. **Choked flow** is the phenomenon of accelerating a vapor to maximum velocity by creating a pressure differential through an engineered opening. By establishing choked flow, the steam mass flow can be metered to precisely control the heating of the liquid. This produces predictable results based on position of the stem plug. Through a variable-area steam diffuser, steam flow is metered at the point where steam and liquid first contact and mix.

### **FEATURES & BENEFITS:**

- **Jet Cooker Steam Injector** delivers turbulent mixing of high velocity steam for to optimize starch cook-out and rapid steam condensation.
- **Adjustable Slurry Gap** – Allows adjustment of steam condensing tube to control pressure drop and increase shear.
- **High Solids Flow** – designed to handle high solids starch slurries.
- **Particle sizes** – up to 0.25" (6mm)
- **Internally Modulated Steam Injection** controls mass flow of steam allowing for stable operation.
- **Positional Steam Inlet** allows steam inlet flange to be rotated in 360° for ease of steam piping connection.
- **Auto or Manual Control** – Designed for pilot plant & test lab operation where manual control of unit is desirable for intermittent test and short run batch testing.

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**PILOT STARCH COOKING SYSTEM – PROCESS & COMPONENT DIAGRAM**



**Control Loop Key:**

PV – Manual Pressure Control Valve	FM – Magnetic Flowmeter
PI – Pressure Indicator	P – Variable Speed Positive Displacement Pump
TIT – Temperature Indicator/Transmitter	HV – Manual Hand Valve
TIC – Temperature Controller	PI – Pressure Indicator

The above diagram is designed to demonstrate the basic components and instrumentation required for a Pilot Lab or Test Lab starch cooking system. Please contact ProSonix for additional piping and system recommendations to insure successful operation.

**Standard Features:**

- Flow rates Model PSX38-CSS from 0.25 – 1.0 gpm (0.375" connections)  
Model PSX50-CSS from 0.5 – 3.5 gpm (0.5" connections)  
Note – Flowrates are estimated and are subject to R&D verification, steam pressure, & temperature conditions. Max particle size 5 mm.
- Auto - Integral Linear Pneumatic Actuator (no steam pressure control valve required)
- Manual (Optional) – Manual handwheel to control steam flow
- Adjustable pressure drop adjustment
- Air Supply: 40 psig
- Control Signal: 5-15 psig
- Connections: NPT Threaded
- Design Standard: ASME Section VII, B31.1
- Pressure Rating: Up to 150 psi at 400 °F

**Materials of Construction:**

- Steam Injector: 316 SS
- Liquid Contact: 316 SS
- Steam Head: 316 SS

**Connections:**

- Steam: 0.375" or 0.5" NPT Threaded
- Liquid Inlet: 0.375" or 0.5" NPT Threaded
- Discharge: 0.375" or 0.5" NPT Threaded

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