

How “Zero Flash” Works

“Zero Flash” is a steam fired fluid heating system developed as a result of over 30 years of experience with customers who wanted a simple yet reliable water heater that would also save energy on a daily basis. The “Zero Flash” system is far less complicated than conventional systems and utilizes a proven ASME U tube designs shell and tube exchanger to convert steam to heating a fluid. Zero Flash heat exchanger has a unique counter flow fluid path and operates at very low pressure to take advantage of the higher latent heat of steam and also sub cools the condensate without additional components and completely eliminates energy wasting flash steam.

❑ **Eliminates Costly Steam Pressure Reducing Stations**

Steam PRV stations are totally eliminated when using “Zero Flash”. The EPT balanced pressure and temperature control valve modulates the high inlet pressure steam to very low outlet pressure in the “Zero Flash” exchanger while electronically controlling the temperature of the outgoing fluid simultaneously. A steam safety relief valve is added as an extra precaution for safety.

❑ **Eliminates Main Drip Trap and Costly Flash Tanks**

- ❑ Conventional systems need main drip steam trap stations to remove condensate at the PRV station and ahead of the TCV 1/3 / 2/3 control station. “Zero Flash” incorporates a steam conditioning separator that utilizes one drain trap that sends the high pressure condensate to a JCM mixer that totally diffuses the flash eliminating all flash tanks and vents. Standard Condensate Systems can be used and all flash tanks and special “Low NPSH” condensate systems are eliminated. Standard electric or non electric pumps can be used to drain condensate from different sources.

❑ **Eliminates Costly 1/3 / 2/3 Temperature Control Valve Stations**

Conventional systems use 1/3 / 2/3 control valve stations to produce accurate control results. The “Zero Flash” utilizes the EPT electronic pressure and temperature control valve with single seated balanced trim producing float turndowns to 100:1 and outlet temperature accuracy of $\pm 4^{\circ}\text{F}$ with a single valve while providing dead tight shutoff to Class VI.

❑ **How does Zero Flash work?**

“Zero Flash” heater controls steam to 2 psig in the heat exchanger with pressure as high as 150 psig to the control valve inlet utilizing the single seated balanced trim control valve and outlet steam diffuser. Low pressure steam enters the shell at the rear to avoid impingement on the tubes. As the steam condenses it transfers all the latent heat energy to the fluid being heated. The unique tube bundle has “Segmented V-Cut Baffles” and counter flow which sub-cools the condensate before it drains from the shell. The counter flow design allows the coldest incoming fluid to contact the condensate at the point where it drains from the shell to pull the maximum Latent heat BTU’s and eliminate the possibility of energy wasting flash steam. The process is **Simple – Reliable – Energy Saving** this is Zero Flash.

TH-500ZX “Zero Flash” Hot Water Heating System

- Saves Energy
- Save Installation Cost
- Save on Retrofits



Accepts Up to 150 psig Steam

Zero Flash System eliminates large steam pressure reducing valve stations and saves up to 40% over conventional installations. The single seated balanced trim control valve controls both temperature and steam pressure in the shell without pneumatics. All TH-500ZX units have ASME Safety Valves.

Saves Energy Eliminating Flash Steam to Atmosphere

The TH-500ZX fully condenses the latent heat BTUs and discharges condensate below 212°F eliminating flash steam. No flash tanks are required and condensate can be discharged directly to an electric or pressure powered condensate return pump system. Up to 5% of the steam can be saved!

Fully Electronic Integrated and Hydronic System Compatible

The EC-800 Electronic Controller interfaces with BACNET, Modbus, Lonworks and many other BMS protocols so that temperature can be reset, remote start stop, and feedback points are available to the user. In addition this system can be used with all VFD drive hydronic pumping systems for a complete integrated system. Flows to 1200 GPM.

