

K500 Series Hydroheater for Abrasive Applications Product Overview and Benefits

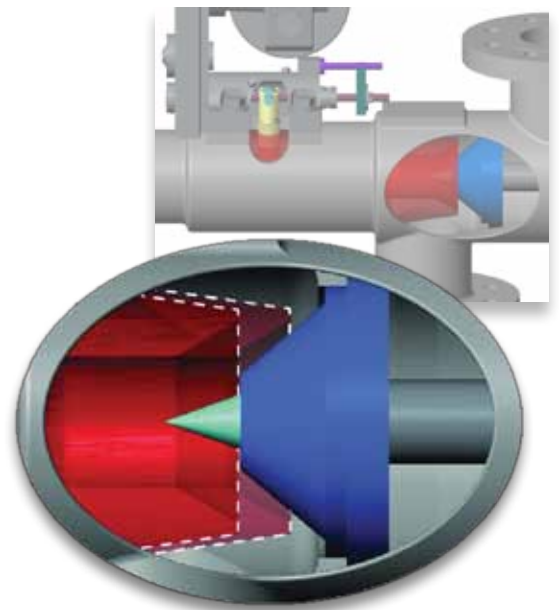
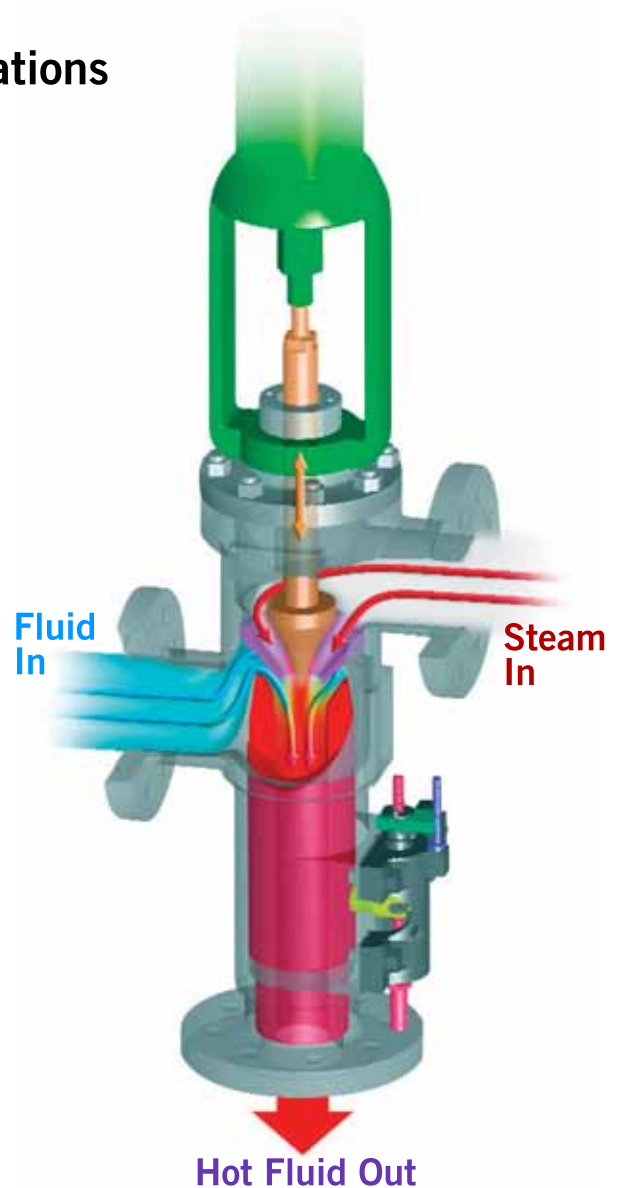
The K500 series Hydroheater is used in a wide range of industries including: ethanol & grain processing, pulp & paper, food & beverage, wastewater, mining, chemical and more. It is very effective for heating complex fluid types because of the adjustability inherent to this configuration. This workhorse has been used in many applications, with decades of solid experience, making it the outstanding leader in direct steam injection heating.

Key design features include:

- » **Internal Modulation:** Steam flow is controlled at the injection point, not by an external steam control valve. Steam velocity and mixing is consistent across the operating range and other dynamic complexities are minimized.
- » **Choked Flow:** Steam to process pressure operates in the choked flow regime, resulting in excellent steam mixing, uniform heating and process stability.
- » **Adjustable Flow Geometry:** Both steam and process geometry can be adjusted, providing excellent turndown ability.
- » **Customized Internal Components:** Each application is engineered specifically for your process and further modification is possible.
- » **Robust design:** Heavy-duty design; constructed by an ISO 9001 and PED certified manufacturer

Process Benefits:

- » **Non-clogging:** Internal modulation and choked flow eliminates clogging of steam supply. The Hydroheater self-cleaning design sends high velocity steam through the heater, eliminating fouling and clogging opposed to numerous applications where heat exchangers and spargers are used.
- » **Near instantaneous heating:** Provides a highly mixed, homogenous temperature profile. Condensation occurs within the heater and is minimized in the downstream piping eliminating hammer as seen in less complex steam sparging configurations.
- » **Process stability:** Operating in the choked flow regime means that a process pressure change will not affect steam flow, and thus, temperature. This results in a stable process with less hunting and variation. In contrast, when using sparging-type steam injection systems, process pressure variations result in temperature variations and process instability.

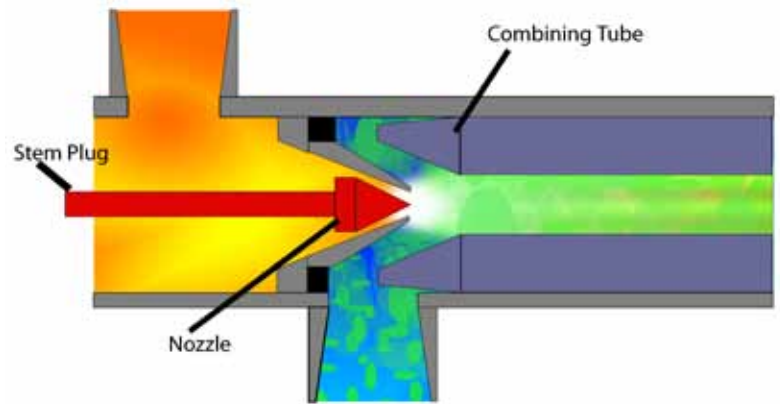


» **Process Flexibility:** If the process demands high turndown, either in steam usage or flow rate, the Hydroheater is well-suited because of the adjustable combining tube to maintain flow patterns.

Adaptation for Abrasive Fluids

The K500 series Hydroheater is very robust and reliable, and can be further enhanced as needed for heating abrasive fluids. For many applications, weld overlay and enriched material in key areas is sufficient. For example, when heating grain slurries with some sand content, stellite weld overlay on components has resulted in solid life improvements and a good value. Other fluids have required more extensive improvements. In oil sands froth heating applications, for example, the improvement involves a combination of a sleeved combining tube (Carbide blends, Ceramic, etc) with Tungsten Carbide weld overlay on other components. Other challenging applications have been successfully engineered; for example, abrasive fluids with low pH, where both abrasion and corrosion must be dealt with simultaneously.

Further changes for abrasive applications include special attention to seals and packing, and replaceable bushings in high-wear areas. Hydro-Thermal's Engineering team is ready to offer a customized solution to challenging applications.



K5 Autopilot

The K5 Autopilot was originally developed to provide exemplary starch conversion in the biofuels and grain milling processes. However, the variable geometry feature has also been used effectively in other processes. For example, high turndown heating benefits from adjustment of the combining tube. This allows improved flow turndown while maintaining thorough mixing and process stability. In addition, the K5 Autopilot can be used in processes with stringy, fibrous material which could accumulate and clog. The Autopilot feature monitors differential pressure and will open should a clog develop.

100% Performance Warranty

If, at any time and for any reason, a Hydroheater should fail to perform as designed,* and Hydro-Thermal is given adequate opportunity to provide a remedy, Hydro-Thermal will, after receipt of the unsatisfactory unit, reimburse 100 percent of the original purchase price.

*Proper replacement of wear parts required



About Hydro-Thermal Corp.

The leader in DSI for over 75 years, Hydro-Thermal has a strong legacy in numerous industries with direct steam injection heaters worldwide. This knowledge has been successfully leveraged to energy savings and sustainability. Let Hydro-Thermal apply our expertise to your processes!



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