

Hydroheaters are a superior solution for heating wastewater completely, uniformly and optimally. Optimize digester efficiencies by maintaining a tight temperature band, increasing biological activity and solids reduction. Also ideal for effluent digestion, bulk sterilization, or any liquid heating process where fouling is a concern.

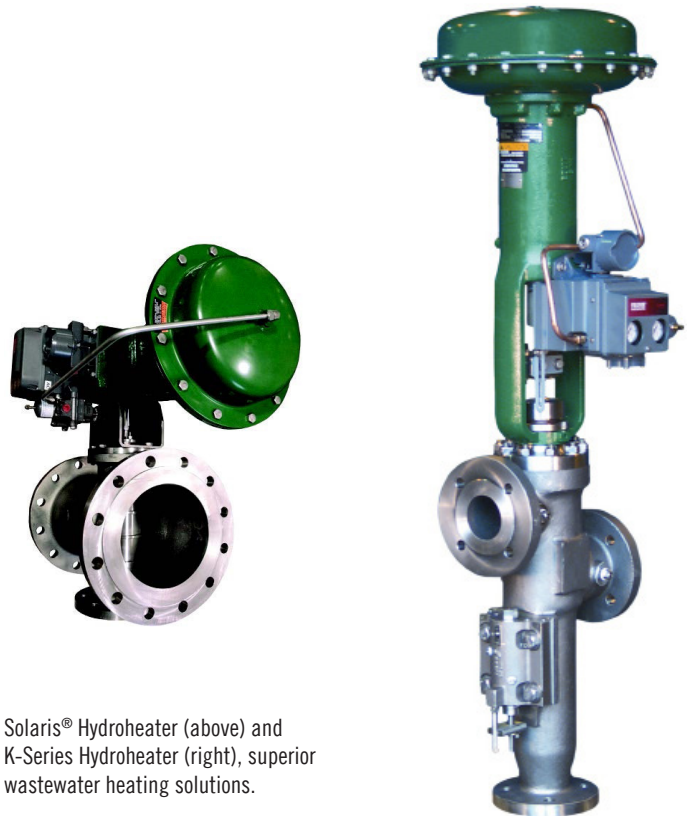
- Direct steam injection means optimal, instant heat transfer with no heat transfer barrier surfaces to foul
- Self-cleaning high velocity steam discharge prevents plugging, fouling and scale build-up
- One Hydroheater can replace several heat exchangers
- Compact size requires a fraction of the space of a heat exchanger
- Precise temperature control to within $\pm 1^{\circ}\text{F}$ [$.5^{\circ}\text{C}$] of setpoint

HEATING DIGESTER SLUDGE

In anaerobic digestion, the temperature of digester sludge is often maintained by circulating a portion of waste slurry through heat exchangers. Because a high degree of fouling is likely within the heat exchangers, they are often run with lower than optimal media temperatures and at high velocities. These compromises decrease process efficiency and are especially problematic at startup, when a larger temperature rise is required quickly. To address the problem, multiple heat exchangers are often installed in series, a costly solution which increases pressure drop and pump requirements. To aggravate matters, heat exchangers in this service typically require a great deal of space and maintenance and are often down for repairs.

The Hydroheater direct steam injection design enables optimal heat transfer and allows one Hydroheater to replace several heat exchangers. Direct steam injection delivers an instantaneous

transfer of heat from steam to liquid, without heat transfer barrier surfaces to foul. Its high velocity steam discharge is in effect self-cleaning, which also helps to prevent plugging, fouling, and scale build-up.



Solaris[®] Hydroheater (above) and K-Series Hydroheater (right), superior wastewater heating solutions.



Anaerobic digesters, City of Baltimore

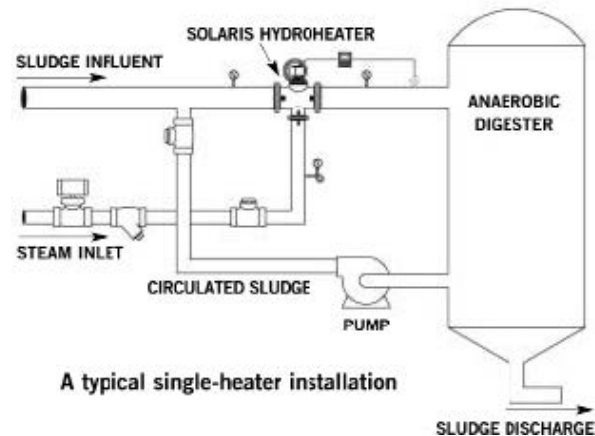
Hydroheater's high heating capability and range enable it to transition easily from shutdown to startup to maintenance mode, bringing a digester up to temperature rapidly and controlling reactor temperatures with extreme precision. A Hydroheater requires a fraction of the space of a heat exchanger and does not require floor mounting. These increased efficiencies and reduced installation and maintenance costs make Hydroheater a proven and superior alternative to heat exchangers in anaerobic digestion.

HEATING DIGESTER SLUDGE

How it Works

Each digester employs one or two Hydroheaters. In a two-heater system, one Hydroheater heats the initial influent up to the optimum digestion temperature, while a second heater heats the sludge stream on a circulation loop from the digester to make up for any heat losses to the atmosphere. In a single-Hydroheater installation, a larger heater is employed to heat the combined inflow and circulation streams to the desired temperature.

In either case, the digester temperature can be maintained as precisely as system instrumentation will allow, often within $\pm 1^{\circ}\text{F}$ [$.5^{\circ}\text{C}$] of setpoint.



PROVEN SUCCESS

The City of Baltimore's Back River plant installed nine K-Series Hydroheaters. The Hydroheaters improved process efficiency, reduced maintenance, and maintained a more uniform temperature. More than thirteen years later, the Hydroheaters continue to deliver reliable service.