



## CALORIX™ System

Direct Fire Wastewater Heating using Biogas

### Key features & benefits

- Highest efficiency heating available (> 100 %)
- No boilers, boiler house or building needed
- No steam required and no water consumption
- No chemicals used

### How we create value

- Small, compact footprint reduces land use costs
- No heat exchangers, reducing maintenance costs
- Delivered as a complete unit for ease of installation





The CALORIX™ direct fire wastewater heater is a recent development for efficient wastewater heating, without the use of boilers and heat exchangers.

#### How it works

In the CALORIX™ system, biogas is burnt at near atmospheric pressure in a combustion chamber, which is mounted in the center of a stainless steel tank and suspended from the roof. A burner on the roof of the tank projects a downward flame into the combustion chamber. The CALORIX™ tank is up to a quarter filled with wastewater, with the hot flame tip staying just above the water's surface. Hot exhaust gases are deflected by the water surface to the annular space around the central combustion chamber.

Wastewater is sprayed around this stage, annular head space for heating, thereby cooling the combustion chamber from the outside and cooling and washing the exhaust



gases. The wastewater is circulated from the bottom of the tank to the head space by a centrifugal pump and a set of non-clog spraying nozzles.

Freshly screened cold wastewater continuously enters the tank. Wastewater is heated within minutes, and flows out of the tank by gravity over a constant level weir. Virtually all the combustion heat is transferred from the exhaust gas to the wastewater. Extra heat is recovered through water condensation, resulting in more than 100 % efficiency (expressed as a lower heating value).

Dust particles, NO<sub>x</sub> and SO<sub>2</sub> are largely absorbed and dissolved in the water, making the CALORIX™ unit an exceptionally clean heating system. The cooled exhaust gas (40-60°C) can be discharged into the air or into the wastewater treatment plant's vent air collection system for odor control.

#### Features

The CALORIX™ system is fully automated, with programmed start and stop sequences. The burner is a modulating type, taking a continuous flow of biogas in a range between 25 and 100 %. The combustion air flow is controlled as a function of the variable biogas flow, giving a constant air to biogas ratio. Liquid Petroleum Gas (LPG) or propane gas can be fired as alternative fuels as well, for example during plant start-up, when biogas is not yet available.

The CALORIX™ system is delivered as one complete stainless steel tank unit, with all equipment mounted on and it included (except for the biogas blower required for larger models).

#### Available Standard Sizes

250, 500, 750, 1000, 1500, 2000 and 3000  
Mcal/h = 1, 2, 3, 4, 6, 8 and 12 MMBTU/h

© Copyright 2013 Global Water Engineering. All rights reserved.