HUBER TECHNOLOGY
WASTE WATER Solutions

Heat Recovery from Wastewater
HUBER ThermWin

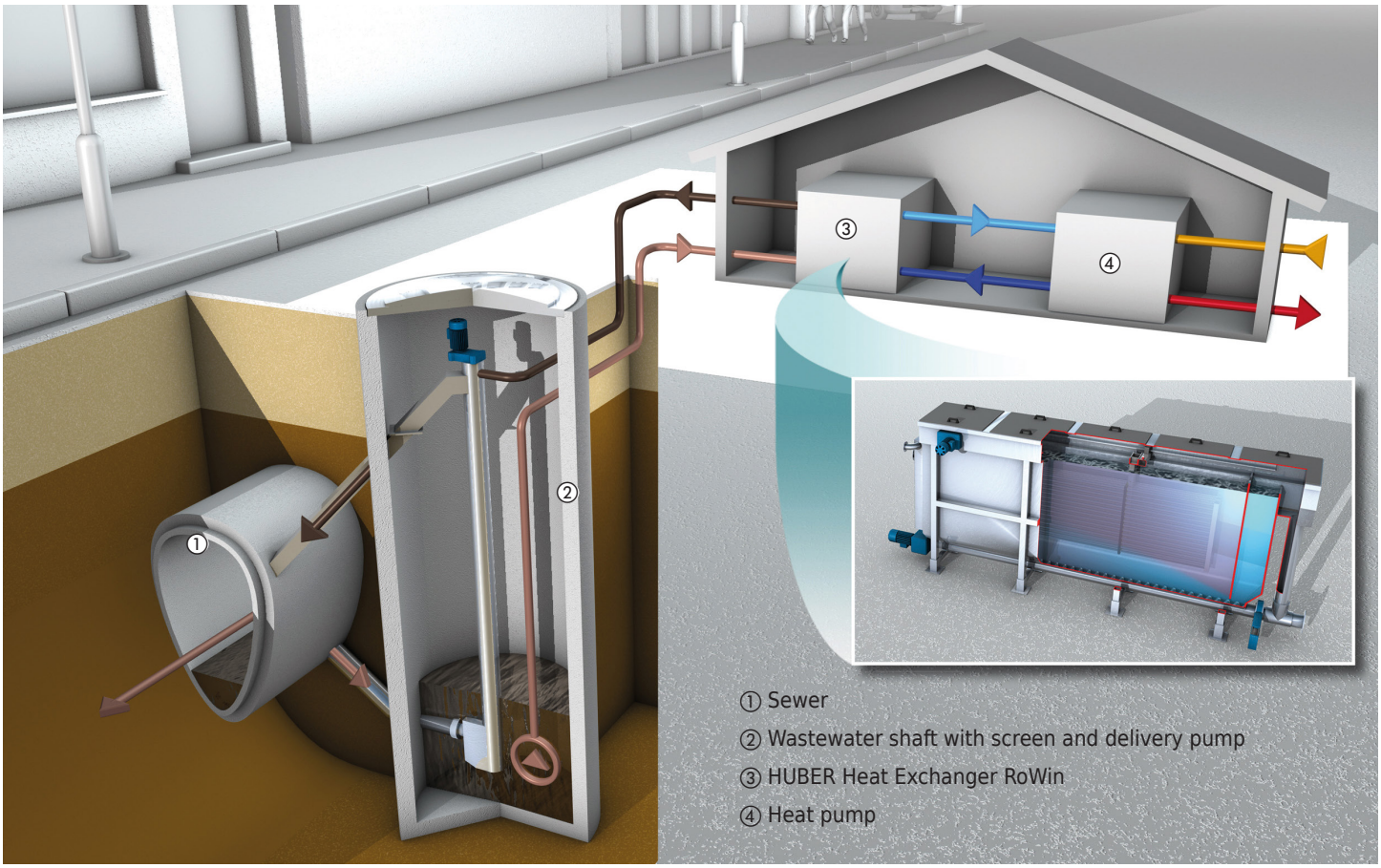
Recovery of thermal energy
from municipal and industrial wastewater

The streets are not paved with gold but ...

... ‘gold’ is flowing under them. Hardly anybody seems to know about the fact that right below the ground, in the sewers beneath your feet, there is a hidden and seldom used source of energy: domestic, municipal wastewater with a temperature of 55 °F to 70 °F. Even during winter the wastewater temperature hardly ever drops below 50 °F. This makes wastewater an excellent energy source for the operation of a heat pump. A heat exchanger is required to extract the heat energy contained within the wastewater. The heat exchanger transfers the thermal energy from the wastewater to the heat pump.

HUBER ThermWin system

The HUBER ThermWin system uses a heat exchanger installed above ground to extract the energy contained within wastewater. A portion of the sewer water flows via an intake structure from the sewer line into a screen that retains coarse solids. This pre-screened wastewater is then pumped to the heat exchanger installed above ground, where it flows down through the heat exchanger unit. This creates continuously stable hydraulic conditions and ensures a controlled heat transfer within the heat exchanger where secondary circuit heating takes place. The secondary circuit is coupled with a heat pump. The cooled wastewater flows back to the sewer taking along the previously screened debris.

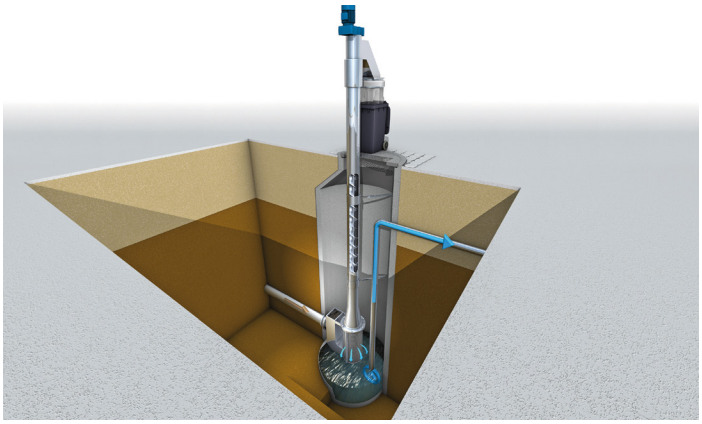


HUBER Thermwin system for the recovery of thermal energy from wastewater

System components

1. Sewer

The HUBER Thermwin operates independently of sewer shape and size. Even low rates of flow are handled without problems due to the pump and gravity system intake near the sewer floor.



2. Shaft with screen

The shaft is located directly at the sewer and has two functions. It serves as a sump for the pump feeding the heat exchanger and houses the HUBER Pumping Stations Screen RoK 4, a vertical screw conveyor with brushes which transports the separated solids up and away to discharge them further down the sewer line. Pre-screening the wastewater protects the heat exchanger against coarse material.

3. Heat exchanger

The HUBER Heat Exchanger RoWin has been developed especially for wastewater applications. The tank is completely made of stainless steel and odor-tight and therefore can be installed even in residential areas. Automatic heat exchanger surface cleaning and a sediments removal screw guarantee continuous system operation with low maintenance requirements. Due to its modular design, the HUBER Heat Exchanger RoWin can be tailored to suit project-specific requirements.

4. Heat pump

Heat pump technology that uses regenerative energy resources such as air or ground water have been around for decades, using the same principle of harnessing passive energy as HUBER ThermWin. Generally the temperature of municipal sewage is relatively constant in the range of 50 °F to 70 °F throughout the year and therefore ideal to heat and cool buildings. Up to 5 kW eco-friendly energy can be generated by investing 1 kW electric energy.

Planning Criteria

1. Wastewater supply

A continuous wastewater flow of approx. 80 gpm is required to ensure efficient heat recovery.

2. Energy yield

The minimum output of useful heat from wastewater is approx. 40 kW. The wastewater temperature should not fall below 50 °F.

3. System requirements

The efficiency of heat pumps increases with decreasing temperatures of energy usage. Especially beneficial are new buildings with low temperature heating systems.

4. Locality

The connection from the heat station to the sewer system and building should be as short as possible to minimize investment and operating costs.

Applications

- Recovery of heat energy and/or hot water
- Heating and cooling
- For installation in nursing homes, hospitals, schools, sports halls, etc.
- Feeding recovered heat into local heat distribution networks
- Usage of an energy source available within city and town areas

Benefits

- Quick and easy installation
- Fast implementation and utilization, compact heat exchanger, easy maintenance, eco-friendly
- Climate-friendly due to CO2 reduction
- Independence of gas or oil
- Independence of sewer geometry
- Cost-effectiveness

Heat station Straubing

Climatization of the Winterthur Wintower building with the HUBER ThermWin® system

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