

Heat Recovery from Wastewater HUBER ThermWin®



Recovery of thermal energy
from municipal and industrial wastewater

➤➤ The streets are not paved with gold but ...

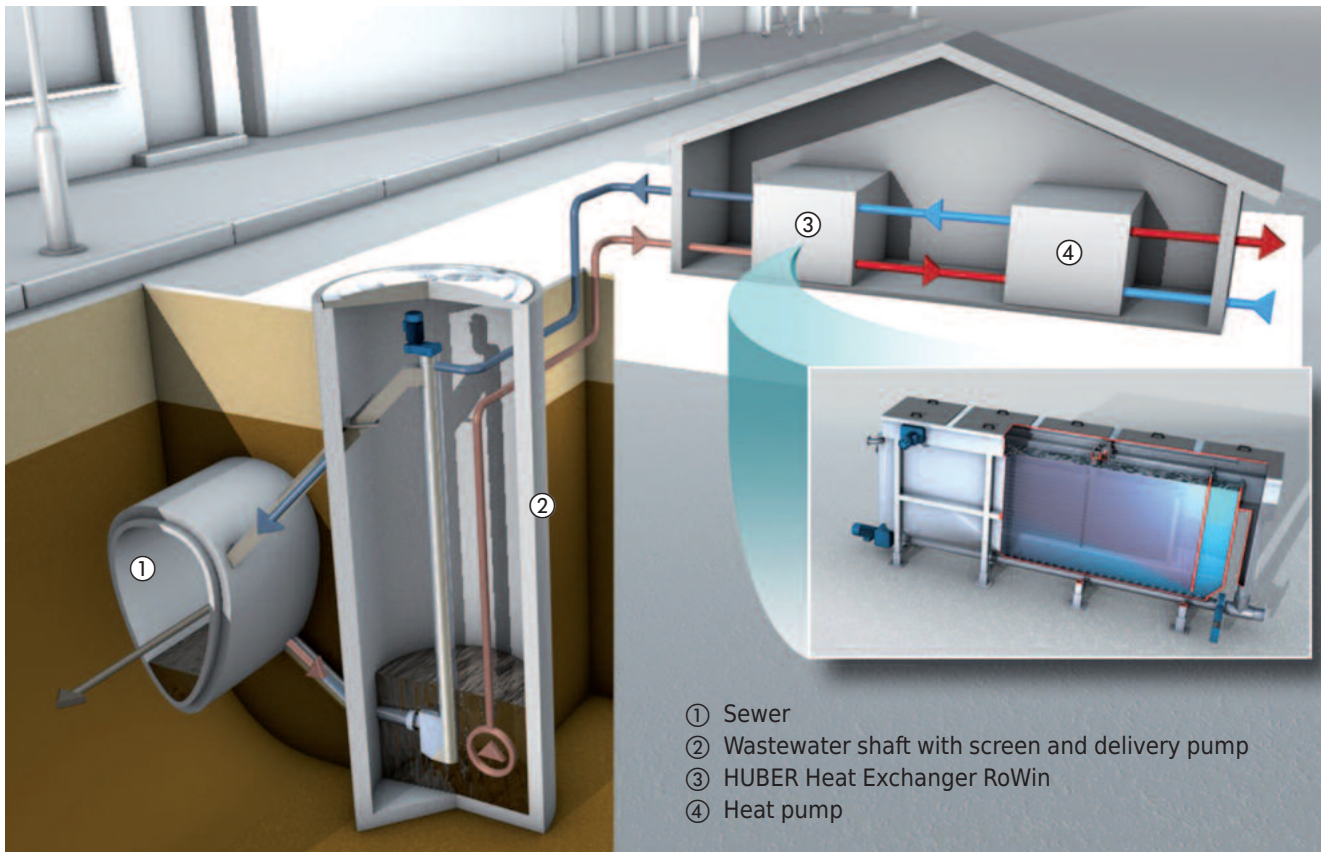
... 'gold' is flowing under them. Hardly anybody seems to know about the fact that right below the ground, in sewers, there is a hidden and seldom used source of energy: domestic, municipal wastewater with a temperature of 12 °C to 20 °C. Even during winter the wastewater temperature hardly ever drops below 10 °C. 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. Via an intake structure a portion of the sewage flows from the sewer into a screen that retains coarse solids. The pre-screened wastewater is lifted and flows by gravity through the above ground installed heat exchanger. 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 screenings.



HUBER Thermwin® system for the recovery of thermal energy from wastewater

►► System components

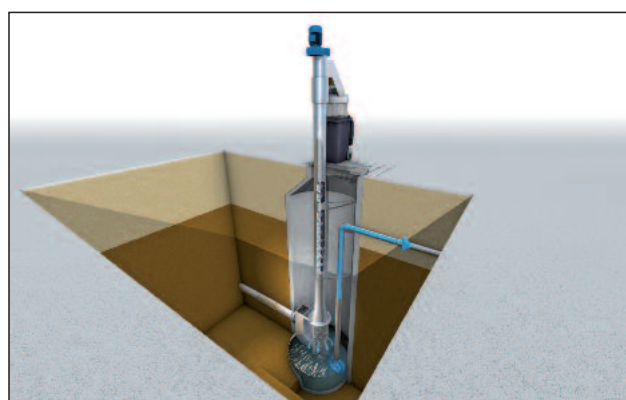
1. Sewer

The HUBER Thermwin® is independent of sewer shape and size. Even small flow rates are handled without problems due to the gravity system and intake near the sewer bottom.



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. This type of HUBER screen is well-proven worldwide and ensures pre-screening of the wastewater to protect the heat exchanger against coarse material. A vertical screw conveyor with brushes transports the separated solids upwards and at its top discharges them to the sewer.



3. Heat exchanger

The HUBER Heat Exchanger RoWin has been developed especially for wastewater applications. The tank is completely made of stainless steel and odour-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

A lot of households in Germany already have heat pumps that use regenerative energy sources, such as air or ground water. Generally the temperature of municipal sewage is relatively constant in the range of 10 °C to 20 °C 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. 5 l/sec 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 10 °C.

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 minimise 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 utilisation, compact heat exchanger, easy maintenance, eco-friendly
- Climate-friendly due to CO₂ reduction
- Independence of gas or oil
- Independence of sewer geometry
- Cost-effectiveness



HUBER Heat Exchanger RoWin installed on the Côte d'Azur



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

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