



Description of the Heat Exchanger System

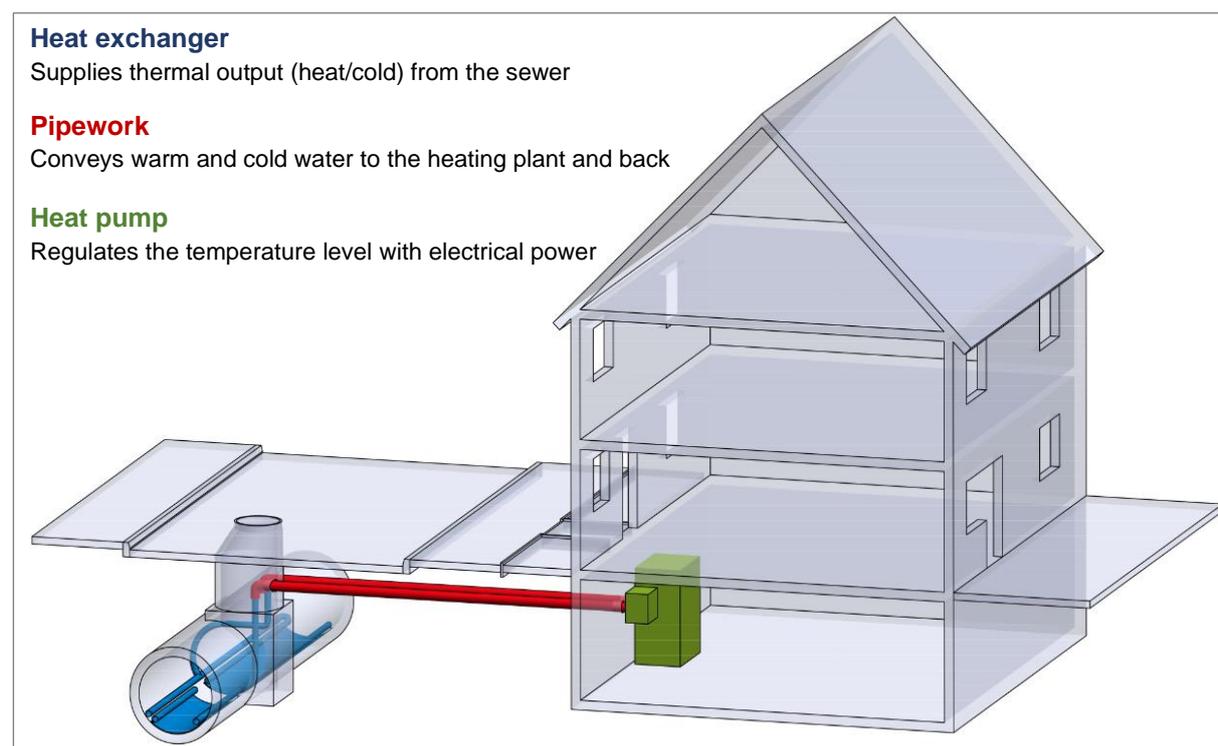
Energy from wastewater with UHRIG Therm-Liner

1. Energy from wastewater – operating principle

There is a massive energy potential in wastewater, which is available in our sewers all the time and in large quantities. Wastewater has an average temperature of 10 to 12°C in winter, and between 17 and 20°C in summer. This temperature represents heat or thermal energy that can be used to heat buildings in winter and cool them in summer. Energy from wastewater is a heat pump technology consisting of three components:

- Heat exchangers: These are mounted in the pipe so that warm wastewater flows across the heat exchanger and transmits thermal energy to the colder water in the heat exchanger.
- House connection: This pipe takes the energy obtained in the sewer to the heating plant.
- Heat pump: This makes the energy from the sewer usable with a low power input.

At good locations, energy from wastewater can incur production costs of around 7 cents pro kWh heating capacity. The heat production costs cover investment and operating costs for the heat exchangers, house connection and heat pump. Good locations are to be found in cities and conurbations, and also in smaller towns and villages that are close to a sufficiently large wastewater collector. Energy from wastewater is competitive with fossil fuels even without any subsidy.



2. Energy from wastewater - project development

If a new building is being constructed or an existing building refurbished, three questions arise as regards obtaining energy from wastewater:

- Is there a public sewer system nearby?
- How much water flows through the sewer?
- What is the temperature of the wastewater?

Using these three pieces of information, it is easy to calculate how much energy can be made available and at what price. Customers can then decide which source of energy they wish to use.

3. UHRIG Therm-Liner – operating principle

The Therm-Liner System is already operating in over 90 locations throughout Europe. Plant sizes vary. Wastewater energy can supply both individual buildings and whole districts. The Therm-Liner System is

- developed for retrofitting in existing and new sewers
- designed in such a way that it does not affect the actual operation of the sewer in any way
- always a custom solution matched precisely to the relevant sewer system
- easy to install, as the modules are positioned using the existing manhole structure
- capable of removal or expansion at any time
- patented and certified

We offer different Therm-Liners tailored to the sewer in question, e.g.:



Therm-Liner Form A



Therm-Liner Form B

4. Production und installation of UHRIG Therm-Liner

The heat exchanger elements are produced by us ready to install. They consist of austenitic stainless steel 1.4404 which, because of its excellent resistance to pitting and corrosion, is ideal for use in wastewater. The heat exchanger surface is pickled and passivated. The structure of the surface ensures turbulence of the wastewater, which reduces biofilm formation on the heat exchanger.

A mechanical coupling system with international approval and certification connects the heat exchanger elements in the sewer. The connection system guarantees secure installation and maximum flexibility. The connecting pipes are adapted to the structure of the sewer and manhole structure. The system meets all the sewer construction requirements of DWA-M 114.

After delivery to the site, installation is carried out by our team. After being brought in, the modules are installed in series and interconnected according to the "Tichelmann principle". A mechanical connection in the sewer and a run-up and run-down ramp fix the Therm-Liner System. The feed and return pipes with shut-off valves are taken upward out of the sewer via the manhole shaft or a cored hole. The system is filled, ventilated and then tested according to DIN EN 805 using the contraction method with 1.5 times operating pressure. The operating pressure for the entire system is generally set at 2.5 bar. Documentation and labelling are according to the SI system.

The Therm-Liner equipment is designed for a working life of up to 50 years. The actual operating duration and safety, however, depend on the subsequent system technology.

5. Contact partner

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