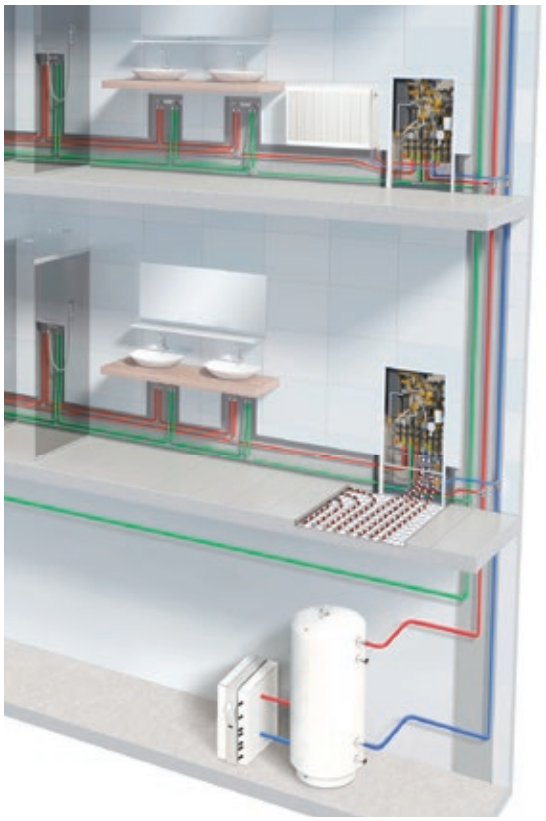
The benefits of decentralised generation of domestic hot water

Comparison between a 2-pipe system with heat interface units and a conventional 4-pipe system with central hot water preparation.

Decentralised heating of domestic hot water

- Decentralised flow heating giving security to residential development heat network operating companies.
- Saving on domestic hot water and circulation pipes from the central heating system to the residential units.
- Low system temperatures in the building pipe-work network, as hot water pipes and circulation pipes are not required.



Centralised domestic hot water storage

- Large storage system subject to mandatory testing by residential development landlords and property owners.
- Increased effort for pipe network, as hot water pipes and circulation pipes are required.
- High temperatures in the building piping network in order to maintain drinking water hygiene and avoid the risk of legionella.

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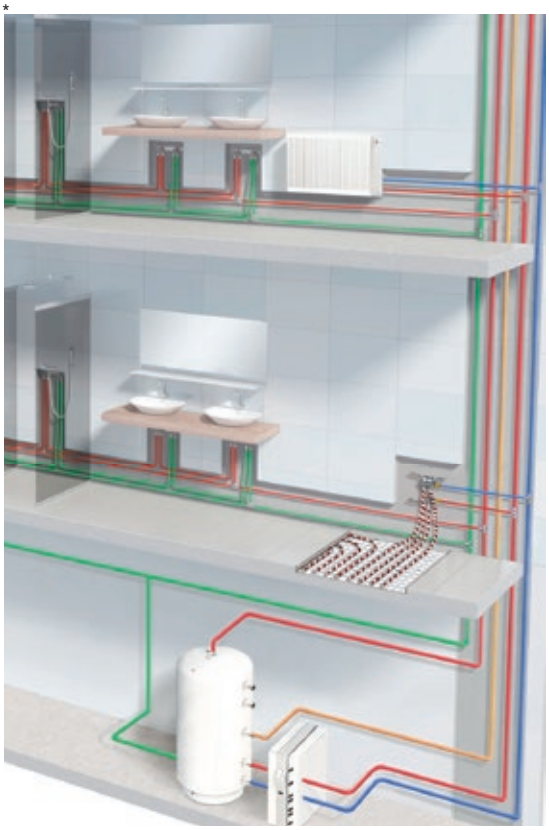


58 % energy saving with 2-pipe systems compared to central domestic hot water systems*

* Final report on the project: "Methods for reducing conventionally generated heat distribution losses in solar-supported multi-family homes" is available on request.

Further benefits

- No need to store domestic hot water in cylinders.
- No need for annual mandatory testing.
- DHW heating using the through-flow principle
- Heating distribution circuit integrated in the station ready for installation
- Pump modules with injection circuit for radiator heating systems
- Residential unit heating system available all year round with individual regulation

Securing decentralised water quality - hot water without the risk of legionella

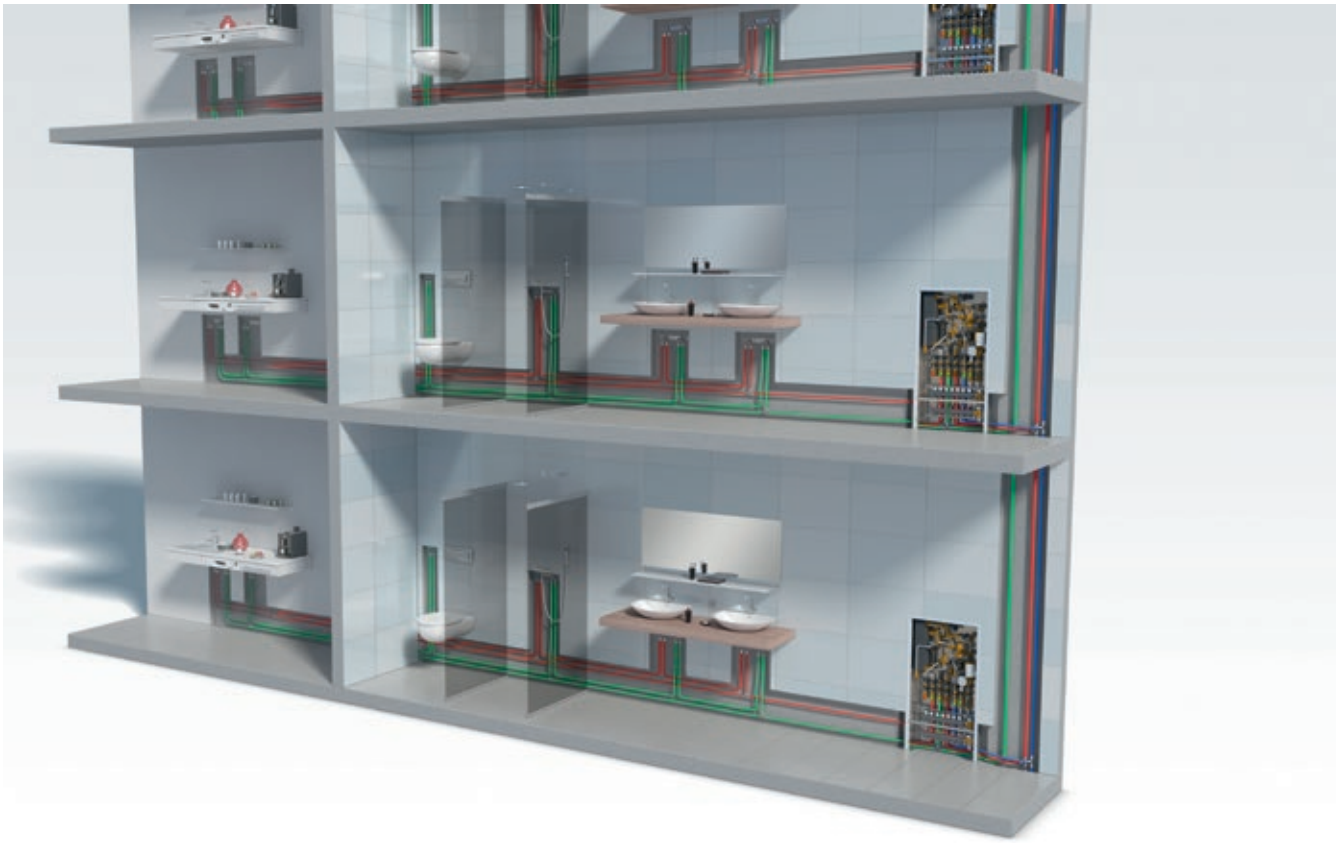
One of the key factors that influence perfect domestic hot water quality is the avoidance of long holding times and unfavourable temperature ranges. Decentralised heat interface units and loop installations offer maximum security, so that the risk of microbial contamination can be minimised.

The requirements for the safety and purity of drinking water are clearly defined. The planning, construction and operational implementation is often associated with problems, as is frequently revealed by the large number of findings over the action value for Legionella. Added to this is the increased demand among consumers for an unlimited supply of hot water from the domestic hot water system at any time, preferably without any long delays.

Two criteria are key for optimum domestic hot water hygiene, according to the generally acknowledged rules of the trade: Regular water exchange within the entire piping system, as well as the maintenance of the required temperatures in the cold water, hot water and circulation pipes. In order to meet these requirements, from the transfer point in the building to the point of discharge, planners, installers and operators are jointly required to ensure that planning, installation and commissioning complies with regulations and legal requirements. Although this may sound complex and highly theoretical at first, life is made easier for all those involved in the construction industry if the risk of contamination is consistently ruled out in the planning phase. Anyone who decides on a domestic hot water supply in accordance with the flow principle with decentralised heat interface units eliminates risks such as legionella growth in cooler strata of central drinking water tanks or extensive circulation pipes.

In accordance with regulations, in decentralised fresh hot water technology, the heat for hot water production is no longer stored in the drinking water itself but in a hygienically harmless form in heating buffer storage tanks. In addition, hot water distribution and circulation pipes in the building, which may cause microbial contamination due to insufficient insulation or poor hydraulic balancing, are no longer needed. A loop-through ring installation is recommended for the hygienic distribution of hot and cold drinking water on

individual floors. This not only allows small line cross-sections and water volumes, but also enables flow through all parts of the pipe, regardless of which tapping points are used frequently, infrequently or not at all. This prevents stagnation in the single-storey distribution system during normal consumption.



In apartment buildings, a separate heat interface unit handles hygienic hot water preparation for each usage unit. An efficient heat exchanger not only ensures a high level of hot water convenience, but also low return temperatures, which in turn contribute to the energy-efficient operation of the heating system. It is also important for the operator that it should be easy to record consumption in every usage unit by means of the directly integrated water and heat meters. The heat interface units are connected directly to the heating supply line in the 2-pipe system so that there is no need for the central hot water and circulation pipes in the supply risers. This reduces the size of the supply risers by approx. 40%. As a result, radiated loss is avoided in the lines and in the no longer required drinking water storage tank. This not only increases energy efficiency, but also - much more importantly for hygiene - also prevents stagnation in the cold water line. Here, in contrast to the central hot water preparation system, a significantly higher water exchange takes place, as the cold water pipe covers the total requirement (hot and cold) of the connected usage units.

Buffering heat instead of storing it in the domestic hot water

In addition, decentralised fresh water technology can effectively counteract the risk of contamination in domestic hot water. The circulation or storage of heated water is completely avoided in decentralised fresh water stations, if possible. Only as much domestic hot water is heated to tap temperature, as the user needs right now. The required energy is not stored in the form of domestic hot water, but rather in buffer tanks that use heating water as a medium. Thus, the concept also meets the requirements of DIN 1988-200, which stipulates: "If energy is to be stored, it should not be stored in the drinking water, but instead the technique of storing energy in the heating system, e.g. through buffer storage, is to be preferred."