

# HUBER Membrane Bioreactors for decentralised applications



- Complete solution for decentralised wastewater treatment for 50 - 2500 PE
- Removal of solids, bacteria, germs
- Hygienisation and reuse
- Compact, small footprint, easy to operate



## ►► The situation

Centralised wastewater treatment plants ensure proper wastewater disposal in many cities on all continents of the world. But it will in future be necessary to provide possibilities for safe wastewater disposal also for the people living in thinly populated decentralised areas. As the costs for sewer system construction and operation are often uneconomical, decentralised wastewater treatment is gaining in importance.

The protection of eco-systems and water shortage in many areas of the world require special, future-oriented solutions.



## ►► The HUBER solution

The HUBER membrane bioreactors with subsequent ultrafiltration represent the best clarification technique presently available on the market for decentralised wastewater treatment.

Even bacteria and virtually all germs are retained so that the hygienic treated wastewater can be reused as service water (e. g. for irrigation). The effluent quality is even far better than required by the EU standards for bathing waters.

With its project-specific design the system can be tailored to suit any requirements and applications.



*Schematic drawing of a MCB 4 x 4 plant for a golf course*

	Unit	MCB 4x3-1	MCB 4x3-2	MCB 4x4	MCB 4x6	MCB 4x8	MCB 4x12	MCB 4x16	MCB 4x20
<b>Waste-water per day</b>	m <sup>3</sup> /d	10	11.5	15	23	30	45	60	75
<b>BOD load</b>	kg/d	2	3	4	6	8	12	16	20

*Overview of smaller applications. Bigger plants are available upon request.*

## ► HUBER MembraneClearBox®

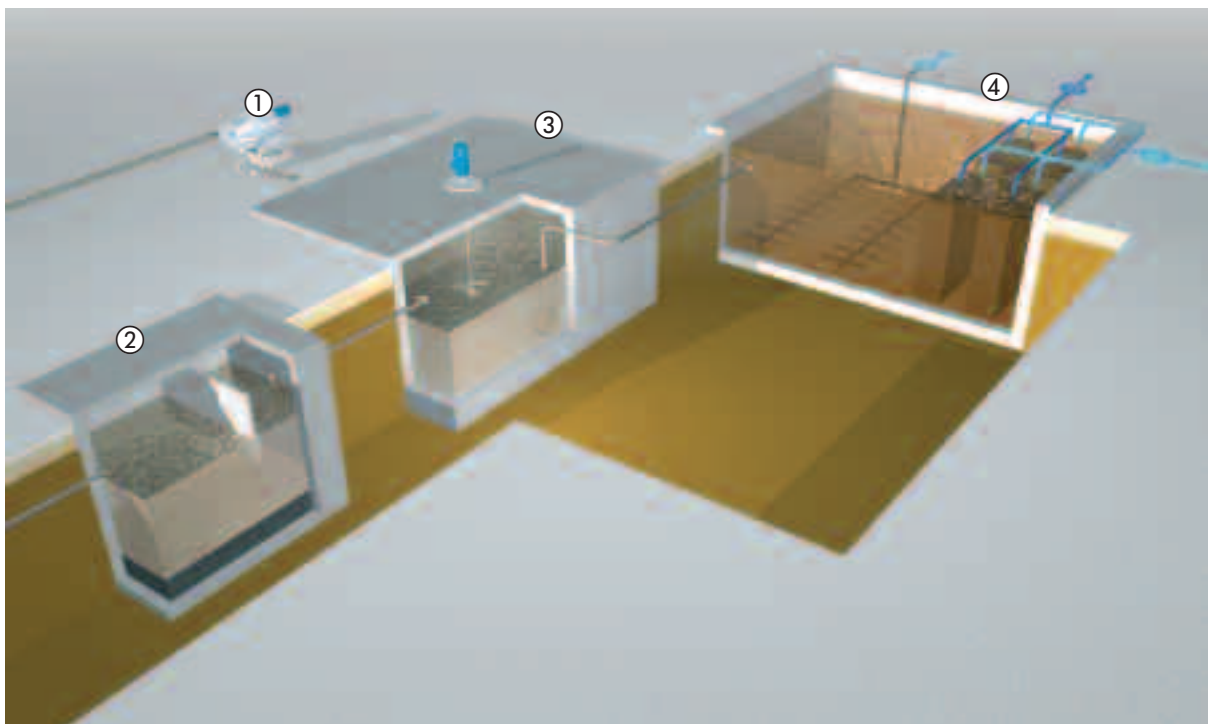
The basis of the MembraneClearBox® technology is the combination of pre-clarification, activated sludge process and separation of clear water with submerged ultrafiltration membranes.

In the preliminary treatment stage the majority of the solids are removed from the raw wastewater by sedimentation (settling tanks) or mechanical treatment (Pipestrainer, fine screens).

The pre-treated wastewater flows through buffer tanks to equalise hydraulic peak loads and then into the biological treatment process. The biological treatment system consists of the membrane plant and a blower system for oxygen supply. Biological clarification is accomplished by microorganisms which decompose the pollutants and nutrients contained within the wastewater and transform them into biomass. Subsequent membrane filtration is performed by the membrane modules with a 38 nm separation size that ensures separation of the treated wastewater from the activated sludge. The membrane itself will reliably retain all solids and bacteria along with virtually all germs as the diameter of the membrane openings themselves is 1,500 times smaller than the diameter of a human hair, which allows for the treated water to be reused.



*Crystal clear permeate*



① Pipestrainer, ② settling tank / pre-clarification, ③ buffer tank, ④ membrane plant

## ➤ HUBER BioMem®

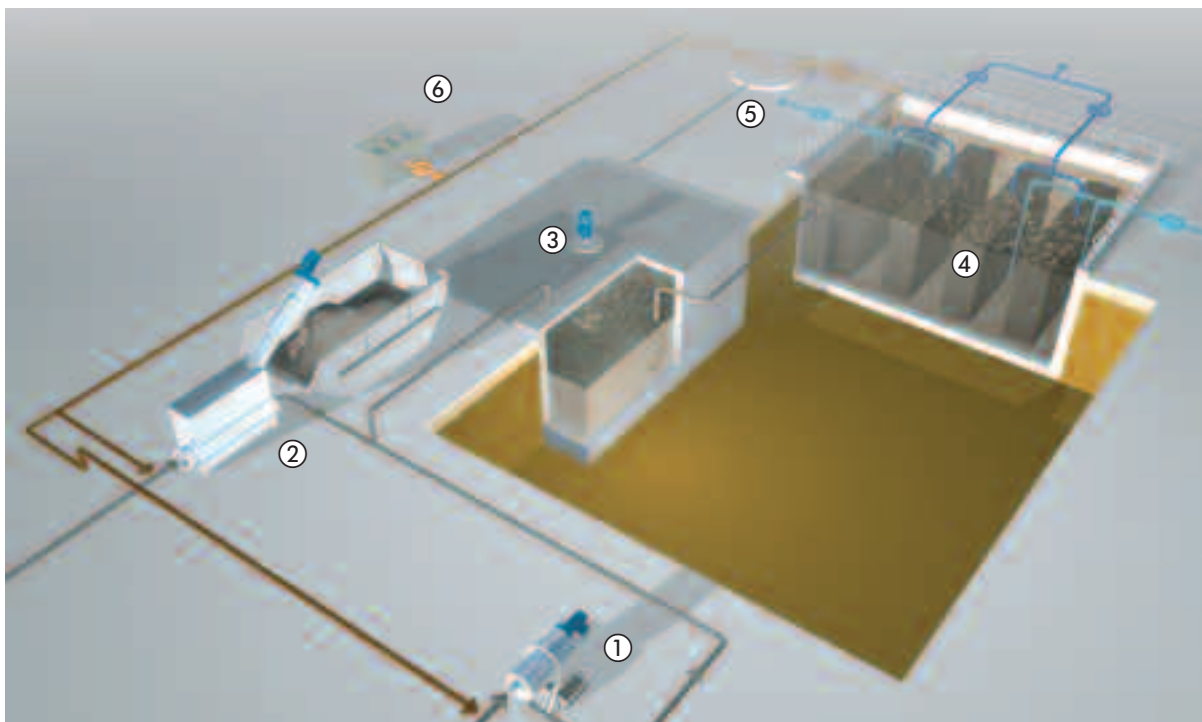
The HUBER BioMem® System is a modular system consisting of individual filtration units that are combined as required due to the specific wastewater and combined water volumes. Whereas conventional membrane plants need aeration tanks or even preceding denitrification tanks in addition to the actual filtration chamber, the innovation of the HUBER BioMem® System is the “all in one tank” solution that eliminates the need for additional recirculation pumps, stirrers, blowers and their complex electrical controls. The system combines the SBR principle and membrane filtration. Both biological treatment and filtration of the clean permeate from the biomass takes place in a single tank.

As the plant concept is automatic operation via two lines, the operating reliability is increased. Even in case of failure of one line the lower filtration efficiency is compensated by the other filtration units at a higher flux. Each line is equipped with one pump for permeate discharge and a blower. The air tubes installed below the filtration units introduce big air bubbles thus preventing the formation of

covering layers and the reduction of the flow rate during the filtration process through generation of a cross flow. The air rising up between the membrane plates generates suction. Water and activated sludge are transported upwards. The generated loop flow ensures sufficient mixing within the tank and simultaneous oxygenation of the biological system.

The HUBER BioMem® system is laid out for nitrification, denitrification or sludge stabilisation, as required. The treated water is separated from the activated sludge by means of the transmembrane pressure difference. Due to the molecular separation size of approx. 150 kDA all solids and virtually all germs and bacteria are retained in the tank.

The system is available as a mobile system in a standardised container or for installation into existing or new concrete tanks. Preceding mechanical pre-treatment is possible with a screen or in a settling tank. The excess sludge produced is thickened in the sludge storage tank or mechanically dewatered.



① Pipestrainer, ② Ro 9, ③ buffer tank, ④ membrane plant, ⑤ storage tank, ⑥ precipitants station

## ➤➤ The benefits

- Compact, modular design
- No investment required for sewer building
- Excellent effluent quality (bacteria-free, virtually germ-free) in accordance with the EU standards for bathing waters

Clarification efficiency (municipal wastewater):

BOD<sub>5</sub> > 99 %

COD > 95 %

AFS > 99 %

Faecal coliforms > 99.9 %

- Reuse of the treated wastewater as service water, for toilet flushing, irrigation, etc.
- Adapted solutions for any application in the field of decentralised wastewater treatment
- Optional greywater applications



*Golf course with clubhouse, Bavaria  
Reuse of treated wastewater*



*Typical application: hotels*

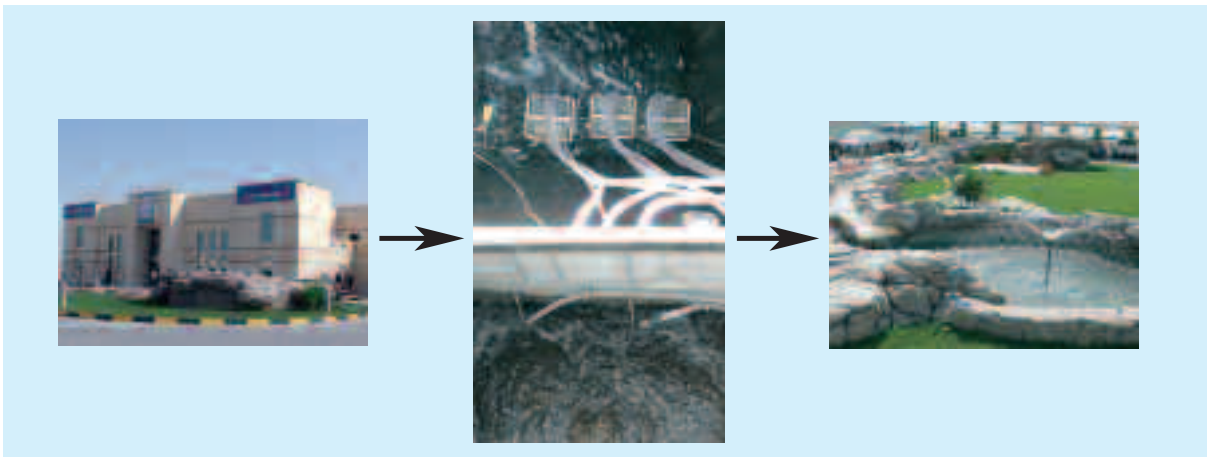


*Application example: decentral residential area*

➤ Installation examples



Wastewater treatment (with reuse) in an exclusive residential area on Cyprus



Wastewater treatment (with reuse) for an office building, Middle East



Wastewater treatment in an industrial plant, Germany

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Subject to technical modification

Decentralised  
Technology