

Simply clean water.

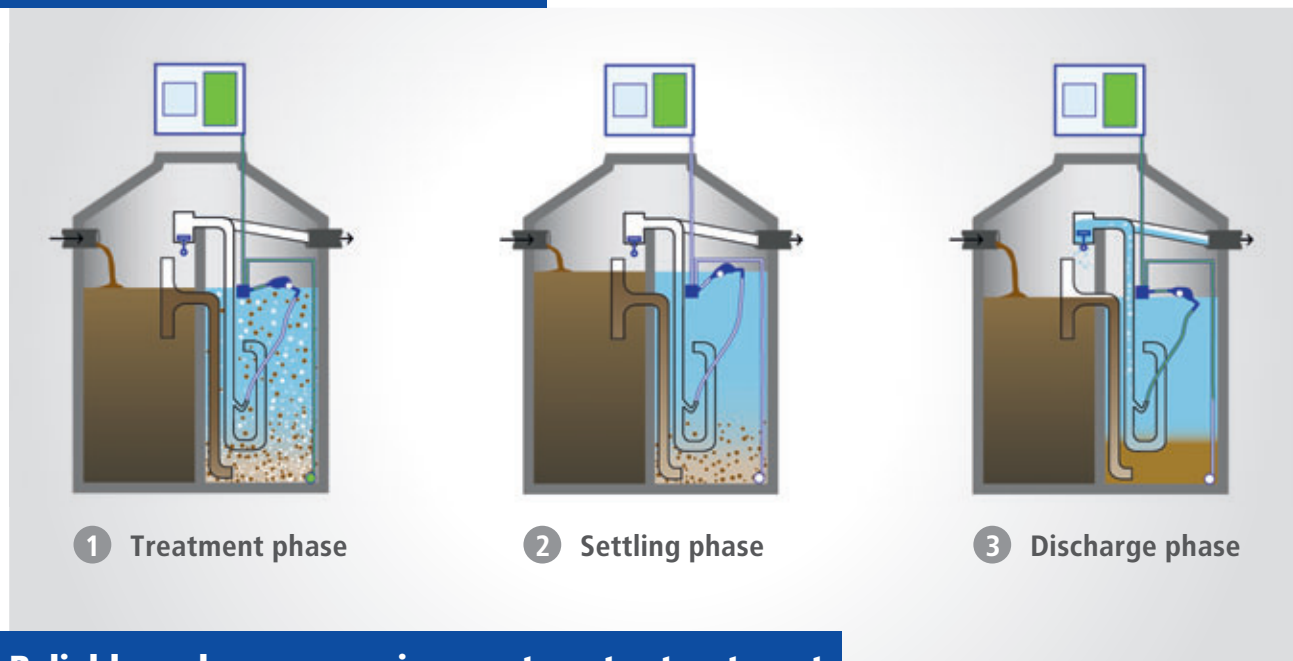


Mature technical solutions for the treatment of wastewater from single and multiple family houses

FULLY BIOLOGICAL SBR SMALL WASTEWATER TREATMENT PLANTS

PUROO®

DESCRIPTION OF PROCESS



Reliable and energy-saving wastewater treatment

The wastewater reaches the preliminary treatment stage which is connected with the biological stage through an opening in the partition wall. The water, treated mechanically in the preliminary treatment stage, flows through a submerged overflow baffle into the activation stage; this can take place during the whole cycle. With the PUROO® small wastewater treatment plant the complete surface of the plant is used as buffer.

A float valve inserted in the activation stage directs the air either to the aeration facility on the bottom or to the air lift pump arranged higher up. With low water level the activation stage is stirred and aerated by the air input. Following appropriate water inflow the valve switches at a defined water level to the air lift pump.

Following the switching of the valve the first surge effects the transportation as sludge return flow and is guided via an outlet opening into the buffer tank of the preliminary treatment stage. The settling phase follows. The activated sludge now sinks to the bottom and in the upper region a clarified water zone is formed.

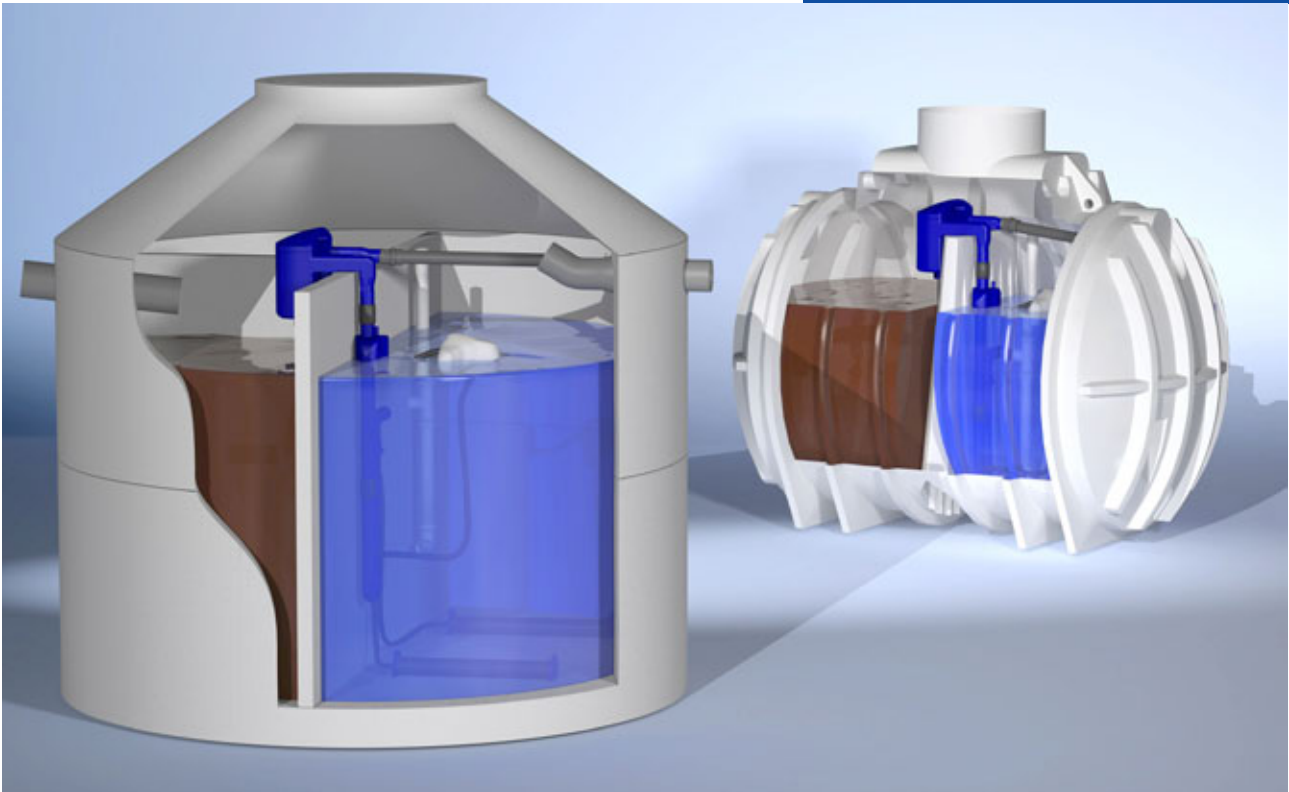
Following the ending of the settling, the air lift pump in turn is flushed with treated wastewater by several short transporting surges. During the clarified water offtake the outlet opening in the buffer tank is closed and the clarified water can discharge via the clarified water pipe.

The treated wastewater is pumped out until the lower switching point of the float valve is reached. When this is reached the plant switches again automatically and mechanically to aeration and a new cycle starts.

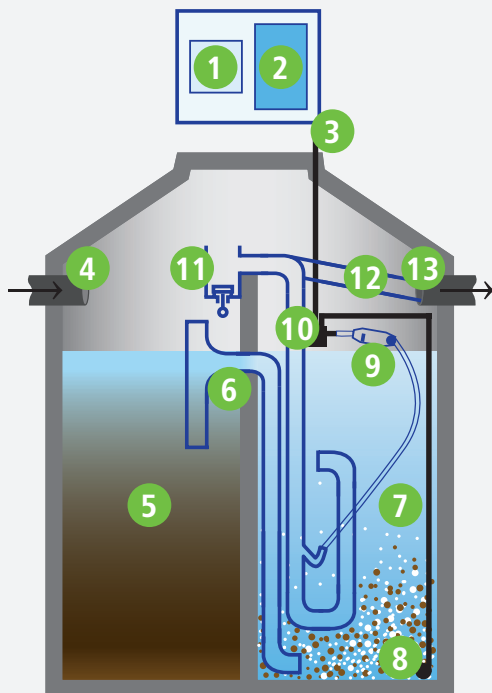
The cyclical treatment process of the plant is controlled by water level. With average water consumption 1 - 3 cycles take place per day.



If no or only very little water flows into the plant over a period of more than six hours following a clarified water removal the plant switches into **economic mode**; after 48 hours into **holiday mode**.





Our PUROO® plant functions this way



Schematic diagram; depending on the plant and installation variant, mounted on partition wall or suspension for tanks without partition wall (concrete or plastic tanks).

1. **Automatic control**
2. **Membrane compressor**
3. **Air hose**
4. **Inflow**
Untreated wastewater flows into the plant.
5. **Preliminary treatment stage**
Here the wastewater is pretreated mechanically and coarse matter settles.
6. **Overflow baffle**
7. **SBR treatment tank**
Here the biological treatment process takes place using activated sludge.
8. **Pipe aerator**
9. **Mechanical float valve**
10. **Air lift pump**
11. **Buffer tank with sampling device**
12. **Clarified water pipe**
13. **Outlet**
Treated wastewater flows out of the plant.

| | PUROO® | PUROO® Z |
|----------------------------------|---|--|
| Illustration |  |  |
| Connection value | 1 - 16 PT | 1 - 16 PT |
| Technical equipment | Plant, energy efficient membrane compressor, low-wear pipe aerator | |
| Carrier frame material | Plastic suitable for wastewater (environmentally friendly polyethylene) | |
| Possibility for expansion | Up-date function and plant remote transmission / phosphate removal and disinfection (individual purchase) | |
| Energy consumption | With ca. 30 kWh/PT/year the power consumption is very small. | |
| Special features | The plant adjusts very well to fluctuating loads. Along with the very small power consumption the equipment is almost free of wear and scheduled maintenance. | These plant types are especially suitable for tanks with flat covers and two tank systems without partition. |

The power-saving small wastewater treatment plant

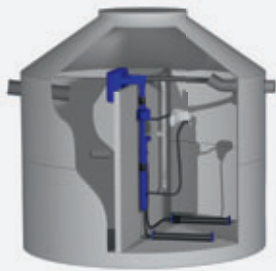
We have put together the best of our proven wastewater treatment plant systems and have thus developed a very simple and reliable SBR technology.

On the basis of our reliable McWater® SBR plant a simplified version of the proven SBR process has resulted which is adjusted precisely to the conditions of single- and multiple family houses. As with our proven APURIS® plant we have done without interference-prone solenoid valves. McWater® and APURIS® are former successful developments for the german market.

From our AQUAmax® BASIC range of models we have taken over the patented and secure spherical valve. It is thus not for nothing that the PUROO® small wastewater treatment plant is the sum of all ATB innovations; consequently further developed for the requirements of our customers.

PUROO® Completely pre assembled systems

Installation examples:



Concrete tank



Plastic tank "Type A"



Plastic tank "Type R Z"



Plastic tank "Type R T"

1 - 16 PT

The technical equipment (plant, energy efficient membrane compressor, low-wear pipe aerator) is fully pre assembled in the tank.

Plastic suitable for wastewater (environmentally friendly polyethylene)

Up-date function and plant remote transmission /
phosphate removal and disinfection (individual purchase)

With ca. 30 kWh/PT/year the power consumption is very small.

Due to the flexible mounting system, the plant can be installed easily and quickly.
The low installation depth is another advantage of these systems.

THE PROPERTIES



PUROO® is...

...simple.

- There is only one air lift pump, therefore fewer parts have to be installed.
- The laying of lines between control/compressor and the plant, thanks to only one air hose, is simpler than with most other plants.
- No solenoid valve; instead a robust ball float valve, designed specially by ATB, controls the air flow directly, without electrical energy, purely mechanically.
- Operation of the control system is simple as the system has only a few functions.
- The sampling facility is already integrated.

...clean.

The preliminary treatment and SBR chamber and connected to each other through an opening in the partition wall. The greater surface area ensures a better buffering with fluctuating loads. For sufficient security and extension of the service life of the compressor we use at least 80 l/min units. Thus there is always sufficient reserve performance available. Depending on the installation conditions treatment performances of up to 97.9 % with BOD₅ and 95.5 % with COD are achieved (according to testing in accordance with EN 12566-3, PIA, Aachen).

...reliable.

No interference-prone solenoid valves.
No pumps in the wastewater.

The PUROO® plant functions according to the SBR process. For more than 12 years this has been the most utilised system with small wastewater treatment plants. As the plant functions according to the volume of wastewater, even sudden fluctuations in inflow are treated reliably. In addition to the testing in accordance with EN 12566-3 the PUROO® has also proven its flexibility and capacity in further overload/underload situations in an accredited test facility.

The PUROO® plant is supplied with a proven and mature control system which has already been employed for many years with the APURIS® plant.

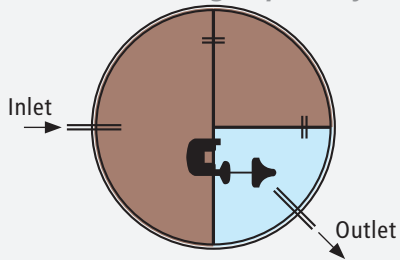
...economic.

With conventional SBR wastewater treatment plants the wastewater is transported twice (1: from the preliminary treatment stage into the SBR tank / 2: to the outlet). As with the PUROO® plant, the preliminary treatment stage and the SBR chamber are connected together, the wastewater has to be transported once only (to the outlet), thus valuable energy is saved. In addition, the service life of the compressor is increased through lower loading.

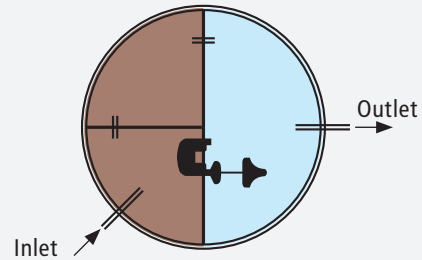
The power consumption per inhabitant and year is approximately 30 kWh.

As no solenoid valves or pumps are used the plant is distinguished by low maintenance costs.

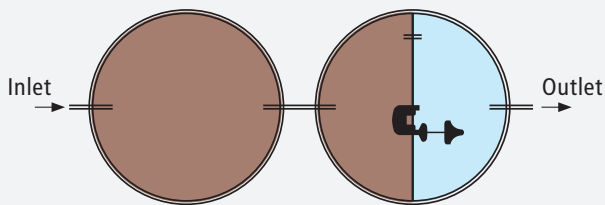
Installation in concrete tank (quarter-chamber; enlarged primary)



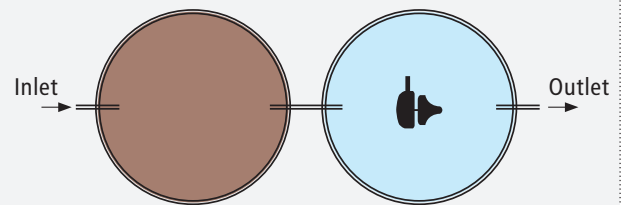
Installation in concrete tank (half-chamber):



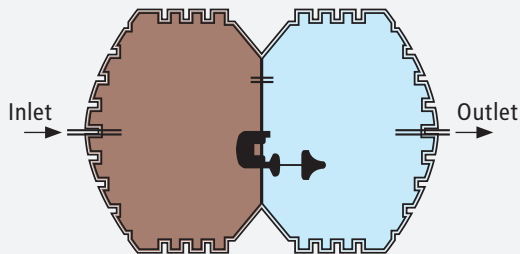
Installation in concrete two-tank model (enlarged primary):



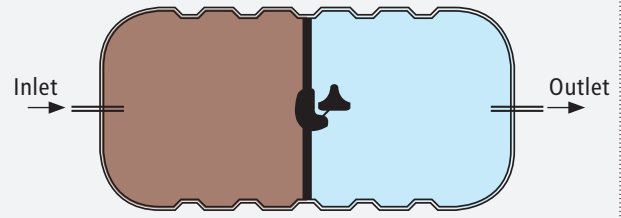
Installation in concrete two-tank model:



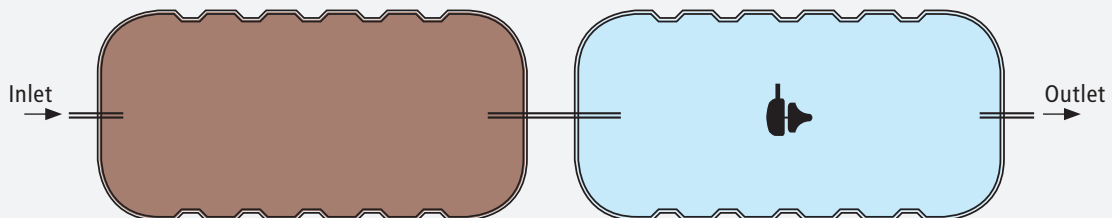
Installation in "Type A" PE double chamber tank:



Installation in "Type 1R T" PE double chamber tank:



Installation in "Type 2R Z" PE tank:



Preliminary treatment stage

SBR treatment tank

These sketches serve as examples; detailed information and data sheets can be found in our plant catalogue or please contact our sales team.

ATB – award winning...

Environment Prize 1999 of the German Federal State of Mecklenburg-Vorpommern • Environment Prize Austria 2001 • Founder Champion 2002
OWL Innovation Prize 2003 • Financial Times Germany "Potential Innovation 2004" • "Finalist" Entrepreneur of the Year 2004, 2005 and 2006
"Finalist" Grand Prize of Small and Medium-sized Businesses 2005 • Innovation Quality Seal "TOP 100" 2006
"Winner" Grand Prize of Small and Medium-sized Businesses 2007 • "Winner" GreenTec-Awards 2014, Category Water and Sewage



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