

THE SEWAGE PLANT



Fully biological
wastewater treatment for
new constructions
and for retrofitting

SBR –
SEWAGE PLANTS ■

AQUATO®PUMP
AQUATO®KOM
AQUATO®KOM-PAKT

AQUATO® SEWAGE PLANTS ■

Fully biological wastewater treatment for new constructions and for retrofitting

As firm as usual, as wear resistant as never before!

The AQUATO® small sewage plant with a new generation of simple connectors for pumps and for aerators – saving time and money!



Clean water is the future – for all of us and for our children and the next generations. Our Wastewater treatment plants – and you – are contributing a good deal to this future. AQUATO®'s sewage plants are offering future-oriented technologies with the best available technology at fair rates and they can comply with the challenges of the future with a minimum effort.

AQUATO® – easy and flexible. So you can preserve a part of the future today along with our technology.

Many old plants operate mechanically using settlement of sludge in a septic tank.

The coarsely pre-treated wastewater percolates into the ground and there, with other pollutants, contaminates our groundwater significantly.

Therefore, more and more countries demand a modernization of the existing old sewage treatment plants according to EU standards!

Aquato® helps you with a reliable wastewater treatment plant of the newest and most advanced generation!

AQUATO® SEWAGE PLANTS...

...are approved by the DIBt. The "Deutsches Institut für Bautechnik" (DIBt) is a governmental institute which monitors and supervises the compliance with European standards and laws and grants national technical approvals for construction products such as sewage treatment plants. For wastewater treatment plants there are currently following effluent classes:

| | |
|---------------------------------|---|
| <i>C- Carbon reduction</i> | <i>(COD <150 mg/l)</i> |
| <i>D- Denitrification</i> | <i>(Total Nitrogen <25 mg/l)</i> |
| <i>P- Phosphate elimination</i> | <i>(Total Phosphates < 2 mg/l)</i> |
| <i>H- Water disinfection</i> | <i>(Total faecal coliform germs < 100)</i> |

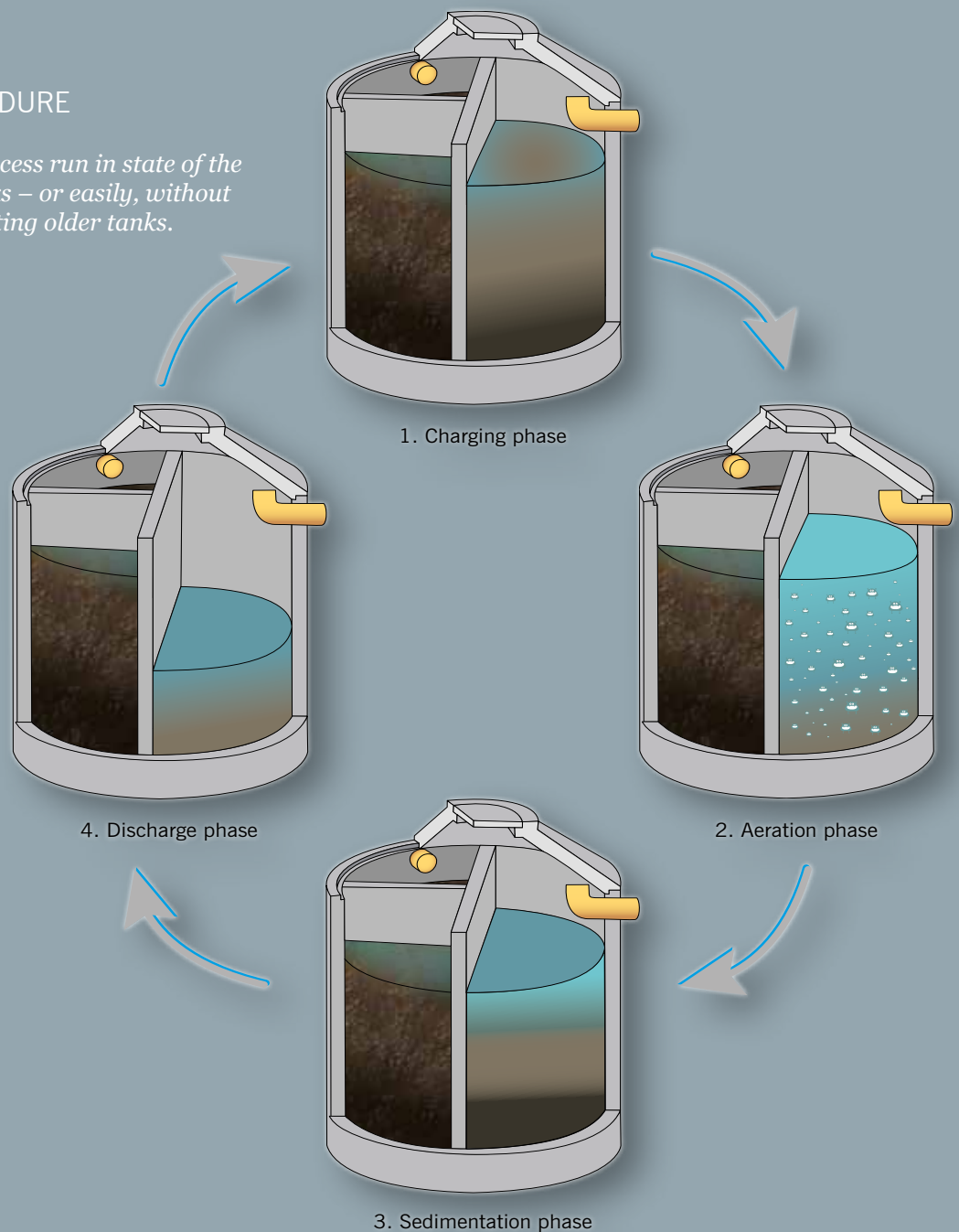
Overview Approval

| Tanks | Effluent classes | Technical approvals Z-55.31- PUMP/KOM | User approvals Z-55.8- PUMP | User approvals Z-55.8- KOM |
|-----------------|------------------|--|--------------------------------|-------------------------------|
| ■ Concrete | C | 275 | 706 | 704 |
| | D | 274 | 705 | 703 |
| | D+P | 356 | - | - |
| | D+H | 357 | - | - |
| ■ PE horizontal | C | 275 | 706 | 704 |
| | D | 274 | 705 | 703 |
| | D+P | 356 | - | - |
| | D+H | 357 | - | - |
| ■ PE vertical | C | 275 | 706 | 704 |
| | D | 274 | 705 | 703 |
| ■ GRP | C | 275 | - | - |
| | D | 274 | - | - |

CLEAN WATER IN ONE CYCLE ■

PHASES OF THE SBR-PROCEDURE

These four phases of the SBR process run in state of the art single or multi-chamber tanks – or easily, without much structural changes, in existing older tanks.



1. CHARGING PHASE

Part of the wastewater, which has been collected inside the primary treatment and which has been cleared from solids, is transferred to the aeration tank.

2. AERATION PHASE

The waste water inside the treatment chamber is intermittently aerated and mixed. Thus, activated sludge is created which contains the microorganisms needed for wastewater treatment. Aeration and resting times can be adjusted to the actual needs of the biology. The excess sludge is transferred to the primary treatment, from where it will be disposed primary with the sewage sludge. If no wastewater is added during aeration phase, the plant will automatically switch to the energy saving mode.

3. SEDIMENTATION PHASE

The activated sludge settles on the ground of the aeration tank. The cleared water rises to the upper part of the tank.

4. DISCHARGE PHASE

The clearwater is pumped out of the tank through the outlet.

AQUATO® PUMP



- High level of operational safety due to modern technology
- Long-life cycle due to proven units
- Significantly below the required effluent limits
- Simple and safe assembly with ready-to-plug units
- Suitable for any approved tank types
- Highest possible adaptability through special adjustability
- Low maintenance costs due to easy handling
- Energy efficient with high performance
- Energy- saving due to integrated economy mode
- Minimal noise emission of pumps and aerators



The AQUATO® PUMP sewage plant owns state-of-the-art pumping technology and can be adjusted in height and therefore be connected to all tank versions. Due to its assembly modules (chain/partition wall attachment) it can be used flexible and versatile.

Powerful aerator with fine-bubble aeration

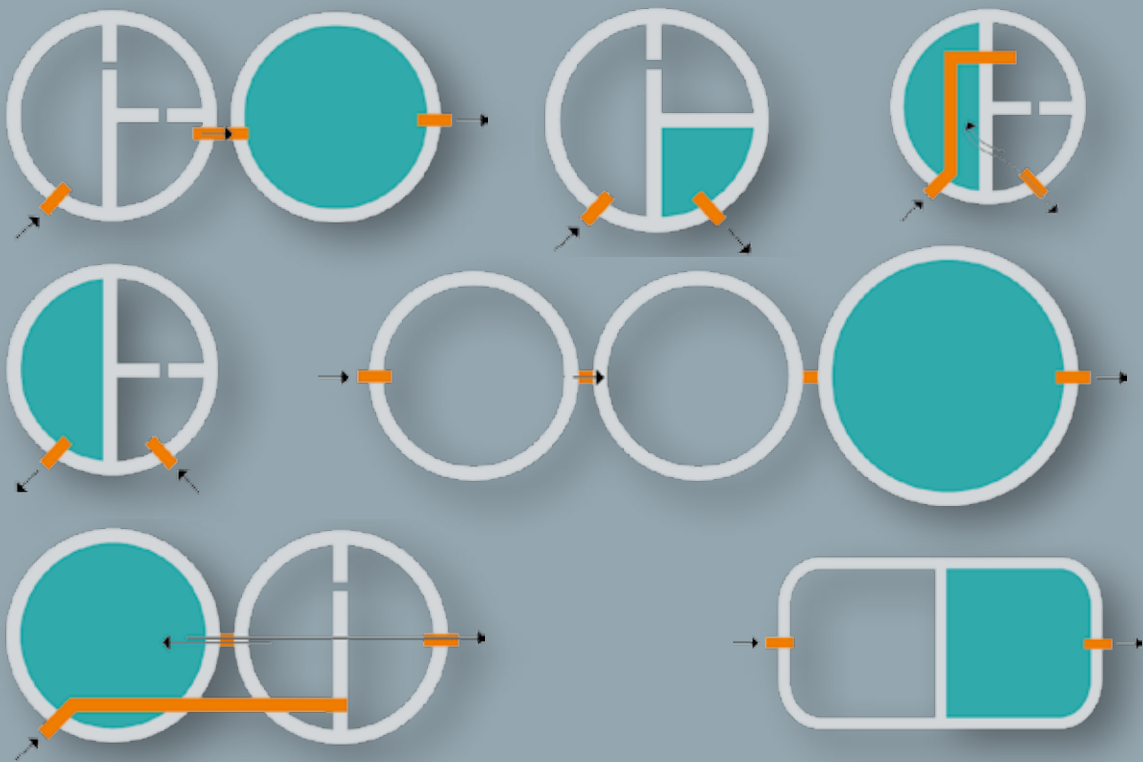
AQUATO® PUMP CONTROL ■



- *Userfriendly, easy menu navigation*
- *Simple read-out of operating hours*
- *Large graphical display*
- *Electronic logbook*
- *Off-grid power failure detection*
- *Manual operation possible*
- *Small and handy*

AQUATO® K-Pilot control panels can also be used as exchange units with other SBR-plants!

THE VARIOUS POSSIBILITIES OF INSTALLATION ■



THE EFFECTIVE OPERATION MODE OF YOUR AQUATO® SEWAGE PLANT



By simply placing AQUATO® technology into a concrete or plastic tank your fully biological treatment plant is ready to use.

AQUATO[®] KOM ...

- *High level of operational safety due to modern technology*
- *Long-life cycle due to proven units*
- *Significantly below the required effluent limits*
- *Suitable for different tank types*
- *High adaptability*
- *Low maintenance costs due to easy handling*
- *Energy efficient with high performance*
- *Energy-saving due to integrated economy mode*
- *Suitable for underloading*

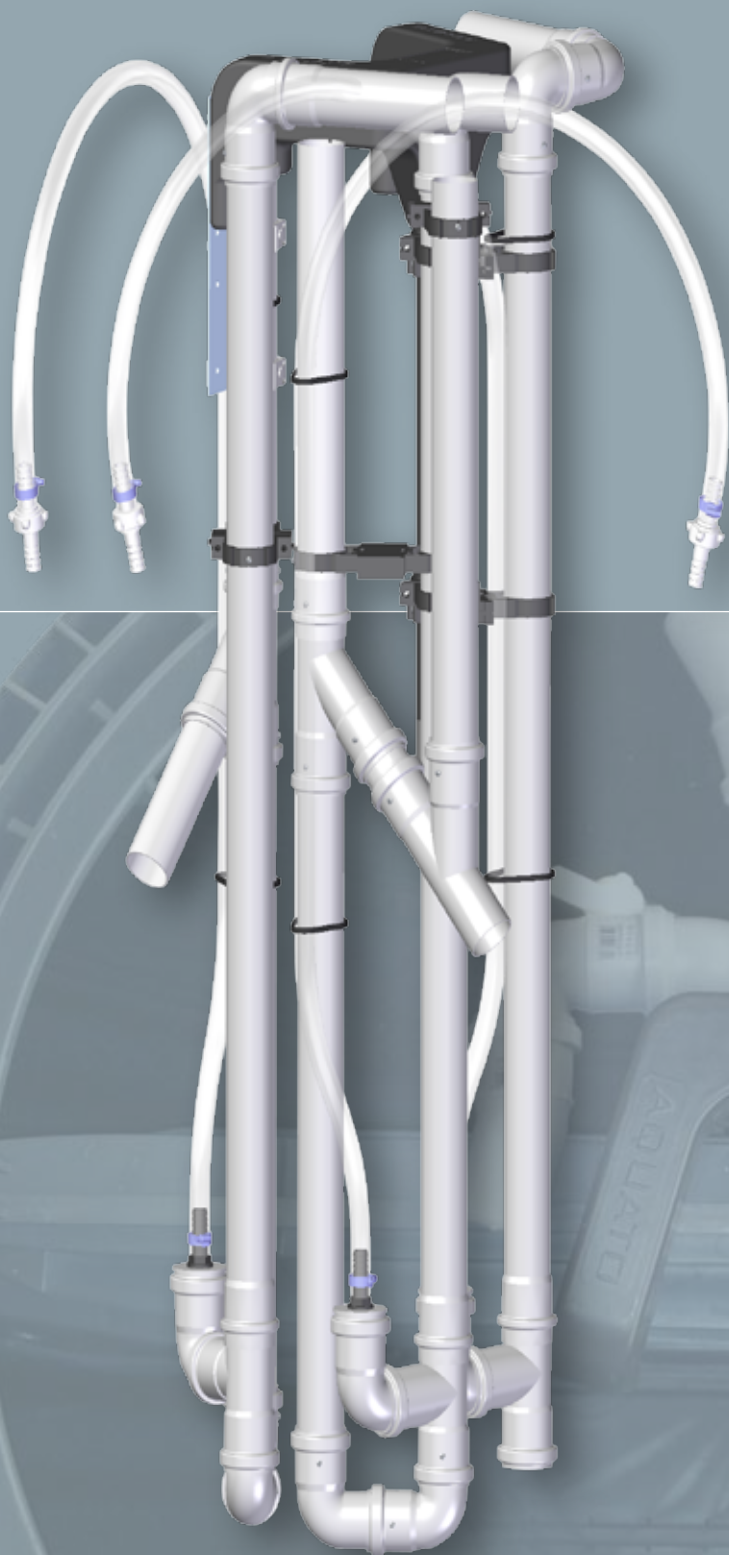


- *The unit is good value and economic in operating*
- *Wear resistant, no electric components in wastewater*
- *Approvals by DIBt/Berlin*



... & AQUATO® KOM-PAKT ■

EASY! PRACTICAL!



- *Grab and go! By hanging on the wall the AQUATO® KOM-PAKT is very easy to assemble and to disassemble*
- *All siphons on a bracket*
- *Compact technical unit*



AQUATO® KOM CONTROL ■



State-of-the-art computer control K-Pilot 18.1 and 18.3 with a large graphic display. It provides all important data at a glance. To minimise maintenance efforts, there is an integrated backpressure monitoring system. With an optional clear water pump even longer distances can be bridged. Furthermore, it is the perfect replacement control for existing SBR plants and adjustable to various conditions.

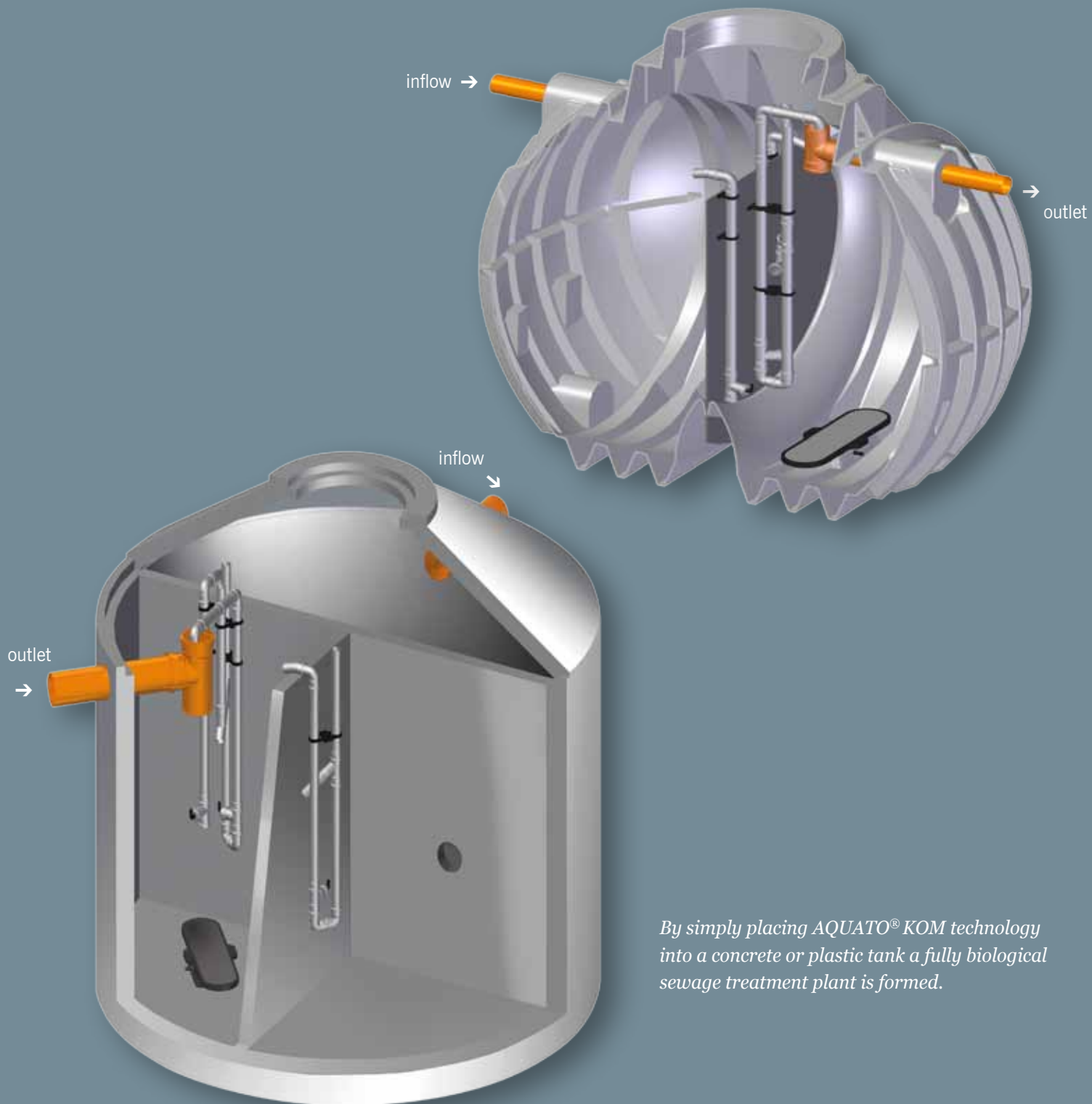
- Modern control for smooth operation
- 6 line graphic display
- Safe and easy handling
- Compact construction due to integrated rotary valves with stepper technology
- Instead of clear water siphon, a submerged pump can be connected



*Compact modular construction:
Optionally as wall bracket,
with closet or outdoor cabinet!*



THE EFFECTIVE OPERATION MODE OF YOUR AQUATO® KOM SEWAGE PLANT ■



By simply placing AQUATO® KOM technology into a concrete or plastic tank a fully biological sewage treatment plant is formed.

Only dad at home? Our plants are under-loadable!



AQUATO® sewage plants offer full cleaning power - from just one person and with low water consumption! But even after your vacation or any other break it immediately goes on again - always reliable with maximum operational safety and compliance with the legal discharge values.

Underload- Everybody is talking about it, we do it!

The rumour persists that small sewage plants are not able to deal with the demands of permanent underloading.

We can not speak on behalf of manufacturers of other systems here, but for AQUATO®KOM, we can prove opposite.

During the harsh winter of 2009, we exposed our purification plant to the thorough inspection of the accredited test laboratory MFPA in Weimar using their official testing field. All testing for the official DIBt- and application approvals is carried out there.

With outdoor temperatures of up to minus 17.5 ° Celsius, an average temperature of 10.9 ° Celsius was measured inside the biology of the treatment plant. Actually, a sufficient de-nitrification is only enabled with a minimum of 12 ° Celsius.

Right from the beginning, the plant reached the required effluent values of class C. To also comply with the effluent class D requirements, it was necessary to modify the adjustments of the plant slightly. During this process, it became obvious that the running times of the compressor as the main consumer of electricity could be reduced significantly. In the end, the AQUATO®KOM reached a COD of 25 mg/l (chemical oxygen demand), a BOD5 < 3 mg/l (biochemical oxygen demand) and NH4-N of 0.1 mg/l.

And we've saved the best for last:

On average, the plant's power consumption was only 0.1 KWh per person per day. This value might even reduce if the AQUATO®KOM is individually adjusted to the operator's characteristics and to the discharged wastewater.

What does that mean for you as an AQUATO® operator?

Purchasing an AQUATO® small sewage plant, you will receive a high-performance and extremely economical small wastewater treatment plant equipped with approved technology.

Because AQUATO® sewage plants just do the job!

MATERIALFORSCHUNGS- UND PRÜFANSTALT AN DER BAHNHAUS-UNIVERSITÄT WEIMAR

MFPA
AMTICHE PRÜFSTELLE
Akreditiertes Prüfzentrum

Fachgebiet: Umwelt
Fachgebietsleiter: Prof. Dr.-Ing. J. Lönz
Betriebsleiter: Dipl.-Ing. J. Müller

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joerg.mueller@mfpa.de

Prüfbericht Nr. 0992 - B 31.09.576.02

Auftrag: Kleinkläranlagenprüfung im Unterlastbetrieb
Anlage: AQUATO® kom, 8 EW
Auftraggeber: Aquato Umwelttechnologien GmbH
Boriesstr. 10
32051 Herford
Auftrag vom: 02.11.2009
Prüfergebnisse: Zusammenfassung aus MFPA-Prüfbericht B 31.09.576.01 vom 14.07.10

| Mittlere BSB ₅ – Fracht (Zulauf) | 0,093 kg/d | |
|---|------------------------|-------------|
| Hydraulischer Tageszufluss | 0,26 m ³ /d | |
| Werkstoff | Beton | |
| Reinigungsleistung | | Ablaufwerte |
| CSB | 98,1 % | 25 mg/l |
| BSB ₅ | 99,5 % | < 3 mg/l |
| SS | 98,8 % | 9 mg/l |
| NH ₄ -N ¹⁾ | 99,8 % | 0,1 mg/l |
| N _{ges, avg} ¹⁾ | 55,6 % | 25,8 mg/l |
| Stromverbrauch | 0,10 | kWh/(E x d) |
| | bzw. 0,59 | kWh/d |

¹⁾ ermittelt für Temperaturen im Bioreaktor ≥ 12 °C

Im Auftrag

Weimar,
03.08.10

Dipl.-Ing. J. Müller
Betriebsleiter



Katrin Neumeister
Dipl.-Chem. K. Neumeister
Laborleiterin

Dieser Prüfbericht wurde in 4 Exemplaren ausgestellt; umfasst 1 Seite (ohne Anlagen) und darf ohne schriftliche Genehmigung der MFPA Weimar nicht anderweitig
verwendet werden.
Alle Prüfergebnisse beziehen sich ausschließlich auf den im Prüfbericht angegebenen Prüfgegenstand. Die geprüften Proben werden nicht aufbewahrt.

DISINFECTION WITH UV MODULE THE SUN AS AN EXAMPLE!



WHY UV DISINFECTION?

■ With an UV module the highest level of wastewater treatment can be reached. The precious water is now available, e.g. for garden irrigation. But also environmental and water protection is being taken care of. This is the latest technology for clean and cross-generational future!

OPERATION OF AN UV LAMP

■ The disinfection performance of an UV system is based essentially on the fact that each volume element - as it flows through the UV reactor - receives the required UV dosage. To ensure this, the radiation field and hydraulics in the UV system are perfectly adjusted.

- *UV module as an additional treatment stage*
- *Ideal maintenance due to installation in outdoor cabinet*
- *Low maintenance with high operational safety*
- *In stainless steel housing*
- *High reliability*



THE PHOSPHATE ELIMINATION ■



Since the 1980s, the phosphate elimination was introduced in wastewater treatment, in order to prevent the lack of oxygen in the receiving waters, and particularly in water conservation areas. Phosphorus compounds act as fertilizers and are the main reason for eutrophication (nutrient accumulation) in stagnant waters and streams.

Field of application with AQUATO®PUMP and AQUATO®KOM / KOM-PAKT.

With a P-module for phosphate elimination a dosing pump adds a coagulant like ferric chloride from the reservoir to the wastewater in the biological stage and ensures the removal of phosphorus compounds. Nature will be grateful !!!

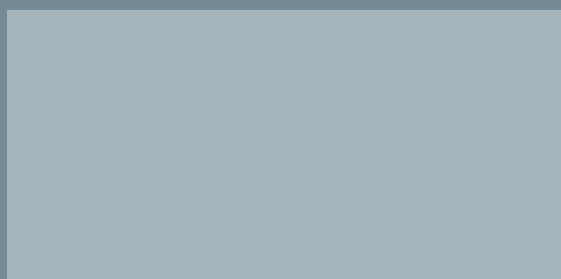
- *P-module as an additional treatment*
- *Reservoir made of steady plastic with a bolt dosing pump*
- *High operational reliability*
- *Low maintenance*
- *Refillable by a long hose*
- *Easy installation due to suspension chains*
- *Safe against unwanted access when inside the tank*
- *Can be retrofitted to any existing sewage treatment plant in operation*



Stand 04/18

AQUA TO *live!*

Presented by:



AQUATO UMWELTECHNOLOGIEN GMBH

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