KLARO

The sophisticated wastewater treatment system technology

We provide you with clear water

No mechanics in the waste water

No pumps in the waste water

No electric parts in the waste water

The KLARO principle: maximum operating reliability!

No mechanics in the waste water

Just an extremely quiet high-performance air compressor in the control cabinet

No pumps in the waste water

All conveyance is controlled using compressed air

No electric parts in the waste water

All current-carrying equipment is located outside of the container in the switch cabinet

More than 155.000 people clarify their waste water with KLARO!

Trust the competence of the market leader in SBR systems with compressed air lifting technology.

Experience and competence in wastewater treatment systems – be it for a single household, communal facilities, communities, gastronomy,...

KLARO has been providing clear water since 2001. We get involved wherever it is not economically viable to connect to the sewer system. No matter whether it's a detached house, hotel or municipality – KLARO has the right wastewater treatment system for every application, from 1 to around 1.000 inhabitants. The KLARO modular principle guarantees maximum flexibility and a future-proof investment. More than 155.000 people have already placed their trust in KLARO's technology.

Sandane (Nordfjord), Norway, 300 inhabitants, year of construction 2006

KLARO – a story of success

Since 2001, we have been dedicated to developing individual waste water solutions. With more than 20 employees from a wide range of areas, from tradespeople to engineers, we are continually developing ideal and practical solutions to your requirements. Our international client base also confirms our service and high quality.

KLARO wastewater treatment systems are installed in more than 20 countries all over the world. KLARO has already fitted more than 22.000 systems. Qualified specialist partners are always on hand to offer advice, handle delivery and install small and large systems alike. They subsequently ensure that your KLARO wastewater treatment system is regularly maintained and runs smoothly.

Are you looking for a competent specialist partner near you? Then why not contact us?

Technical hotline
+49 (0) 921 16279-330

More information can be found at www.klaro.eu

Back to nature – the natural cycle

Each individual consumes around 130 litres of water every day – water which should be cleaned after use as waste water. KLARO wastewater treatment systems safely return domestic waste water to nature, therefore harmonising the natural cycle.

„When I bought my wastewater treatment system, reliability was a top priority for me. Three years ago I opted for a KLARO wastewater treatment system. Now I know it was the right choice!"

Most wastewater treatment systems rely on the SBR process. SBR stands for Sequence batch reactor

1 Feed phase
First of all, the waste water enters the sludge reservoir buffer (first chamber), where the solid parts are retained. From there, the waste water is channelled into the SBR container (second chamber) one portion at a time.

2 Ventilation phase
Now, the actual biological cleaning takes place in the SBR container. Ventilation and stationary phases alternate as part of a controlled cleaning process. This creates so-called activated sludge with many of microorganisms and thoroughly cleans the water.

3 Stationary phase
Now follows a stationary phase, where the activated sludge sinks to the bottom of the system. This forms a clear water zone in the top part of the SBR container.

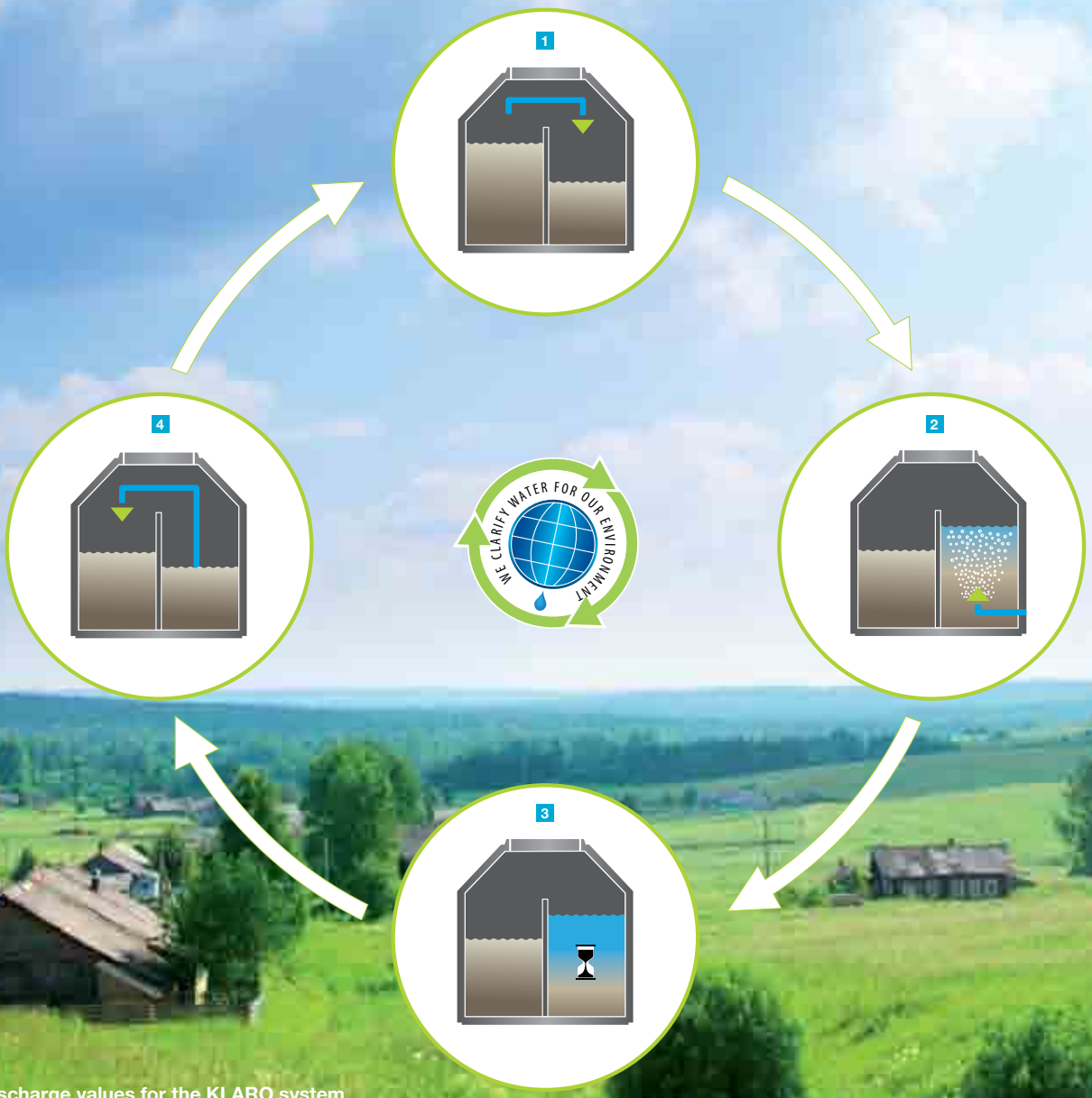
4 Clear water extraction
The cleaned waste water is now channelled into a discharge system (stream, river or lake) or into an infiltration system. The sludge is then extracted back from the SBR container into the first chamber.
The process starts all over again.

98 % cleaning in just 6 hours!

KLARO wastewater treatment systems are based on the proven SBR clarifying principle and are therefore around 70-90 % below the legal limit values.

Sophisticated technology with potential for the future. KLARO technology does what many others can't.

Today, KLARO is more than 70 % below the legal requirements placed on waste water quality. This delivers security for the future – even if more stringent requirements are applied to waste water.



Discharge values for the KLARO system

Limit values	Limit value Discharge class C	Discharge values KLARO Easy*	Undercut as percentage
COD Chemical oxygen demand	150 mg/l	44 mg/l	CSB >70 %
BOD^5 Biologial oxygen demand	40 mg/l	5 mg/l	BSB > 87 %
SS Suspended Solids	75 mg/l	6 mg/l	AFS > 90 %

* Results of the practical test by Prüfinstitut für Abwassertechnik GmbH (PIA, Testing Institute for Wastewater Technology), Aachen, test number 2006-009

Low investment and follow-up costs thanks to a sophisticated product!

Why you should choose a KLARO wastewater treatment system.

A new build or retrofit, an indoor or outdoor control cabinet, a concrete or plastic container – you choose!

KLARO set-up kit, ventilation and lifting unit

EPP indoor control cabinet (up to 8 inhabitants)

Metal indoor control cabinet (up to 50 inhabitants)

KLARO mounting kit:

- For installation in plastic and concrete containers
- Can be used for all new systems and retrofits
- No fault-prone pumps
- All conveyance using compressed air
- No wear, no blockages
- Integrated sampling point
- No live components in the tank
- All components made from waste water-resistant plastic or stainless steel

KLARO EPP indoor control cabinet:

- Minimum space requirement 40 x 54 x 29 cm (w x h x d)
- High-quality cabinet version with contemporary design
- Easy to install on a wall
- Air connections from below
- Cabinet size up to 8 inhabitants
- Extremely quiet air compressor – as quiet as a refrigerator
- Power failure detection as standard

KLARO metal indoor control cabinet:

- The classic
- High-quality metal cabinet version
- Dust-proof encapsulation
- Air connections at the side
- Suited to all system sizes
- Different compressor types depending on requirements
- From a size of 50 x 50 x 30 cm (w x h x d)

Minimum follow-up costs

Thanks to the maintenance-friendly construction principle, virtually all maintenance work can be performed on the KLARO control cabinet. Unpleasant and time-consuming work in the septic tank is generally not required. The integrated sampling point guarantees simple testing of discharge values. A power consumption of just slightly more than EUR 10[1] per year and inhabitant makes KLARO one of the most economical wastewater treatment systems in the world.

Choice of containers

KLARO wastewater treatment systems can be installed in either concrete or plastic containers and have been tested and approved by the building authorities for both container types.

Top discharge values

KLARO wastewater treatment systems have discharge values 70-90 % lower than those required by law. Approvals for phosphate precipitation (discharge class +P) and disinfection (discharge class D+H) ensure that the KLARO wastewater treatment systems can adapt to particular requirements. This means that nothing is stopping the systems from being used in water protection or karst areas.

Safety

A comprehensive service network and tested technology ensures your safety.

Experience

More than 155.000 people already clarify their waste water with a KLARO wastewater treatment system. Why not try a solution from the market leader in SBR systems with compressed air lifting technology yourself?

Outdoor control cabinet
(up to 20 inhabitants)

KLARO-retrofit kit for concrete containers

KLARO-retrofit kit for plastic containers

KLARO outdoor control cabinet:

- Different versions in plastic and concrete
- Timeless, durable design
- Safe function, even in frosty weather
- Can be accessed by maintenance companies at any time
- No installation work in your home
- Extremely quiet air compressor – as quiet as a refrigerator
- Extensive range of accessories available (acoustic and visual warning equipment, sockets, ...)
- Power failure detection as standard
- Size 37 x 80 x 38 cm (w x h x d)

Concrete container

- Up to 20 inhabitants served by one container
- Low-cost
- Various sizes and versions for all loading classes
- With and without anti-buoyancy measure

Plastic container

- Superb value for money
- Lightweight container
- Can be installed without a crane
- Plastic containers come with a 25-year warranty
- Long service life even when subjected to high loads
- Very stable – can be driven on by lorries if fitted with the corresponding cover

*25-year warranty on the plastic wastewater treatment container

[1] At an electricity price of EUR 0.20/kWh

Model-specific options

UV disinfection

State-of-the-art water and environmental protection. KLARO UV disinfection is the simple and low-cost solution for sensitive areas with stringent requirements. The waste water treated in the KLARO wastewater treatment system is exposed to intensive levels of UV light when the clear water is extracted. Micro-organisms are reliably killed off within just a few seconds. And it's done without the use of chemical additives. The disinfected waste water can then be reused as industrial water.

Phosphate elimination

KLARO also offers the perfect solution to minimise the concentration of phosphate in the waste water. An additional metering pump, which releases a special precipitant, regulates the phosphate content of the waste water. This variant is also tested and approved for use in sensitive areas.

Remote monitoring

Remote monitoring: everywhere maximum operating reliability is required. Remote diagnosis allows the system to be monitored by a maintenance company. This enables immediate access in the event of faults, which can often be rectified without the cost of the fitter having to come on site.

UV module

Dosing pump

GSM modem

KLARO UV module:

- Can be retrofitted with ease
- Easy to use
- No environmental impact
- Low operating costs

KLARO dosing pump:

- Complements the modular concept
- Subsequent installation possible
- Long service life thanks to simple technology
- Maintenance-friendly

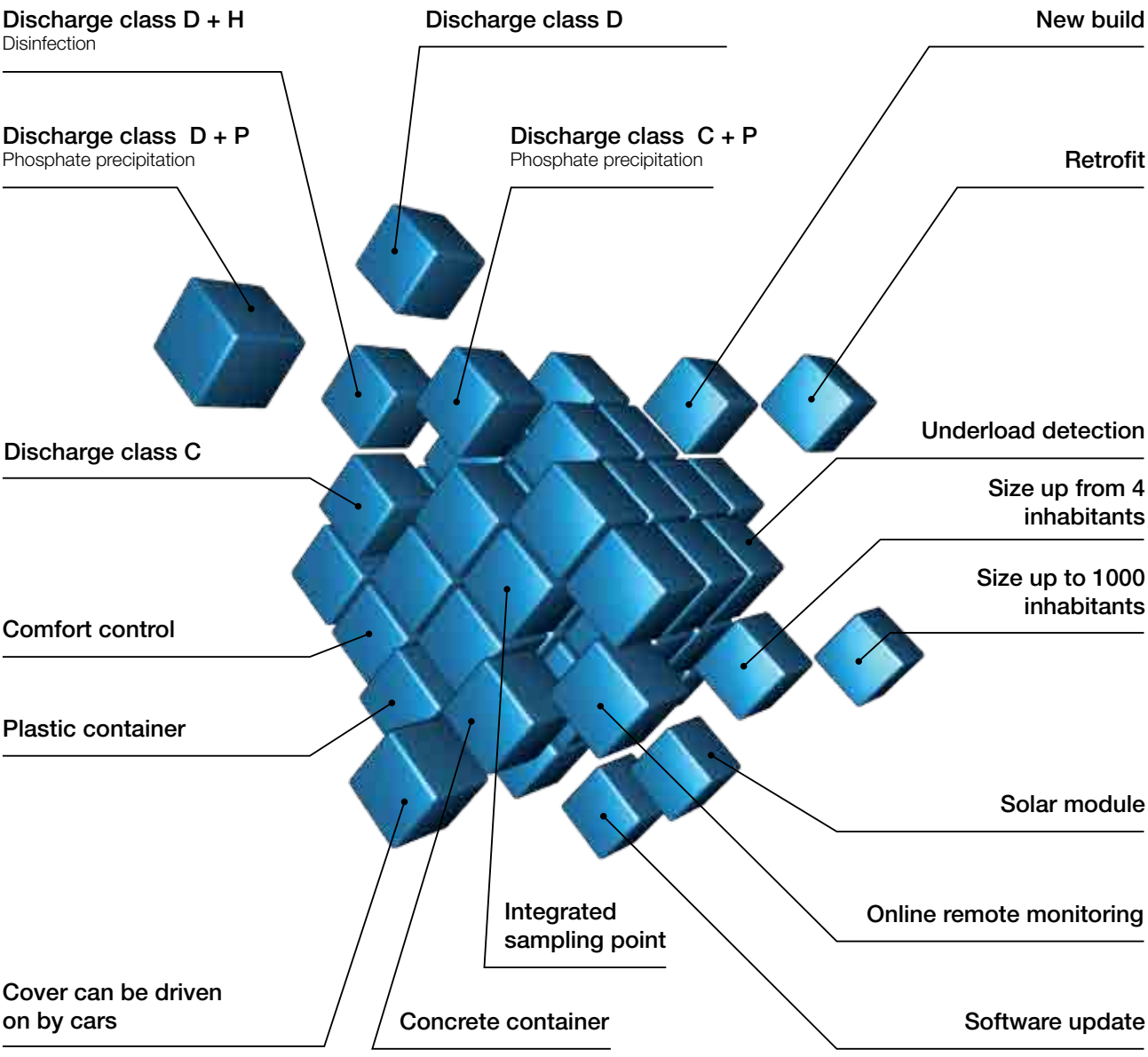
KLARO GSM modem:

- Greater efficiency
- Greater operating reliability
- Optimised service intervals
- Greater customer benefit thanks to monitoring service
- Low-cost remote diagnosis in the event of a fault without the service fitter having to come on site

Future-proof thanks to modular concept!

A KLARO wastewater treatment system can be flexibly adapted to the requirements of tomorrow.

KLARO's modular concept guarantees a secure and future-proof investment. The KLARO wastewater treatment system can be adapted to changed requirements. If required, software updates also ensure flexible adaptation options. Today, KLARO is more than 70 % below the legal requirements placed on waste water quality. This delivers security for the future – even if more stringent requirements are made of waste water.



KLARO – a third more economical than an energy-saving bulb!

The small high-performance compressor in the KLARO control cabinet cuts CO_2 emissions and is therefore extremely quiet, just like a refrigerator.

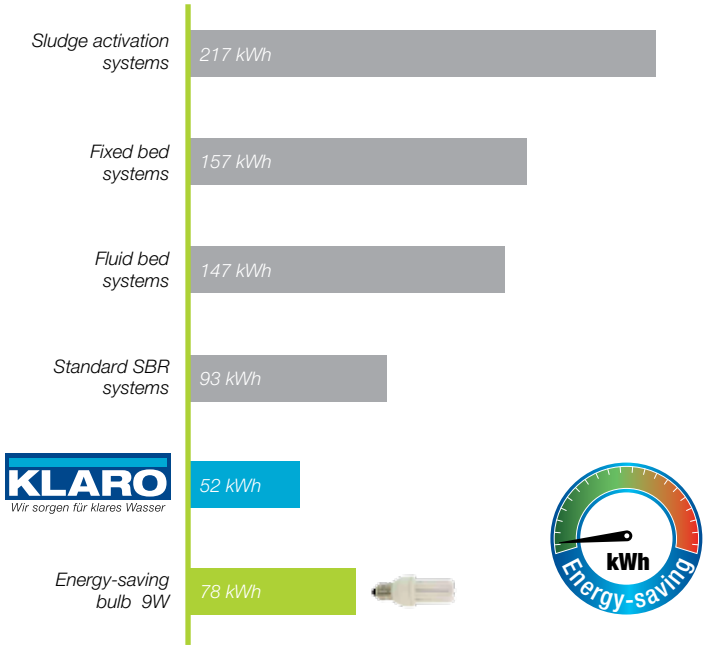
Intelligent adaptation to actual user behaviour cuts power consumption

How do you operate a wastewater treatment system without even a single pump? The solution is simple yet ingenious. A small high-performance air compressor produces compressed air which enters the pipes of the KLARO installation kit and conveys the water. This means that all the conveyance required is controlled without a fault-prone pump.

The result is that a power consumption of just slightly more than EUR 10[1] per year and inhabitant makes KLARO one of the most economical wastewater treatment systems in the world. The use of modern control technology and intelligent software adapts the actual required system run-time to the user profile. With the optional ZKplus control, the system features automatic underload detection, which allows the system to also run perfectly even if you're on holiday for longer periods of time. This results in optimum energy savings and maintenance of the biological processes at the same time. You save up more than 75% in energy compared with other wastewater treatment systems

„I didn't want a wastewater treatment system that would drive up the cost of my electricity bill unnecessarily. That's why I was so impressed with KLARO."

Annual power consumption of wastewater treatment systems[2)]



[1)] *At an electricity price of around EUR 0.20/kWhWh*

[2)] *The diagram indicates the annual power consumption of various wastewater treatment systems. Source: "wwt" magazine, edition 6/2007 "The wastewater treatment system as a permanent solution", page 15. table 3, practical data; KLARO: test report by PIA (Prüfinstitut für Abwassertechnik GmbH, Testing Institute for Wastewater Technology), Aachen, test number 2006-009*

Individual solutions to treat waste water!

Larger systems for between 50 and around 1.000 inhabitants for businesses, gastronomy, communities, camp sites, ...

An invitation to a Scandinavian fjord – our work is always nice and varied

Special requirements need special solutions and the best-possible advice – from the planning stage and to construction of the technical components and the system. Our engineers are available to offer you support during your projects as well as when the system is being built and commissioned if you require it.

We always start with a few questions. Issues such as technical equipment, container sizes and pipework will be discussed with you. Once we have evaluated the relevant information, you will receive our proposal with planning documents. Simply get in touch with us. We can provide you with reference documents for various requirements.

EXPORT WORLDWIDE

„We often plan larger wastewater systems for 100 inhabitants or more. In terms of planning and implementation, we have been putting our trust in KLARO for a long time. The company's experience often shines through in the details."

Frequently asked questions!

1. How often does sludge have to be removed from the sludge reservoir?

Since the DIN was amended, generally you should remove sludge when required, i.e. if a high sludge level (70%) is measured during maintenance, the reservoir should be emptied.. Floating sludge should also be taken into account when measuring.

2. For how long does the sludge reservoir guarantee smooth running of the system when it is operated constantly and at full load?

All KLARO wastewater treatment systems are designed such that full functionality of the system is guaranteed for at least 12 months at permanent full-load operation and when the operator and maintenance obligations are complied with. This period is extended accordingly at lower loads. Alternatively, you can choose a container with a larger sludge reservoir such that sludge can be disposed of at longer intervals.

3. Does sludge have to be pumped out of the SBR ventilation reservoir to guarantee smooth operation of the KLARO wastewater treatment system?

No! The automatic continuous sludge return directly on the reservoir floor prevents large amounts of sludge accumulating in the SBR ventilation reservoir. Specialist staff can perform fine adjustments as part of the maintenance process by changing the cycle times for sludge removal.

4. Why does the KLARO wastewater treatment system work in portions even though there's no float in the system?

The compressor's set run-time for the pump process defines the maximum water quantity depending on the cycle. Thanks to the special design of the compressed air lifter, the water level in the buffer reservoir cannot fall below a minimum level. Because the suction point of the lifter is a long way below the lowest water level, floating sludge cannot be drawn in. All of this functions without a flap, mechanics, electrical pump or float. We stay true to the KLARO principle of having no mechanics or live parts in the waste water, which results in maximum operating reliability.

5. What should be noted if the KLARO wastewater treatment system is permanently operated at underload?

In this instance, we recommend using our ZK Plus control with automatic underload detection. The system only runs smoothly when the flow of waste water is recorded. If there is a particularly low level or if you are away for a long period of time, water is simply circulated. The bacteria required for the cleaning process are therefore automatically activated and kept alive.

„When we were planning our wastewater treatment system, I had a lot of questions. My KLARO on-site specialist partner was always happy to offer competent support."

6. What is the benefit of the KLARO wastewater treatment system's holiday setting?

The option of switching to an energy-saving holiday mode with the KLARO wastewater treatment system allows you to save money at an expensive time of the year. The ZK control requires holiday mode to be set manually, while the ZKplus does it automatically.

7. How often does the KLARO wastewater treatment system need to be maintained and what associated costs does this incur?

According to the building authorities' approval, a KLARO wastewater treatment system with standard power failure detection only needs to be maintained twice a year. Maintenance essentially involves checking the function of the system, monitoring, resetting the cycle times if required and taking a water sample to determine the discharge quality. The concept of the KLARO wastewater treatment system, which is operated purely with compressed air, is maintenance-friendly and low-cost, as no mechanical or electrical equipment needs to be housed in the sludge tank. We stay true to the KLARO principle of having no mechanics or live parts in the waste water, which results in low maintenance costs.

8. How much energy does a KLARO wastewater treatment system need?

Compared with many other systems with SBR technology, KLARO can realise savings potentials of up to 75% thanks to the use of intelligent controls and automatic underload detection. A power consumption of just slightly more than 10 EUR) per year and inhabitant makes KLARO one of the most economical wastewater treatment systems in the world.

9. How long does it take to retrofit a wastewater treatment system?

If you'd like to retrofit an existing system, our partners will advise you. The construction substance has to be tested, and seal integrity ensured to the outside and between the chambers. Only this ensures that the legal discharge value specifications can be complied with in the long term. Responsibly installed, KLARO guarantees safety. We stay true to the KLARO principle of offering serious evaluations and advice and delivering safe installation.

10. Nothing lasts forever. If something is broken, how can I estimate how much a repair will cost?

The costs incurred are extremely low! Because the technical side and waste water are strictly separated, it's generally only a technical component on the control cabinet that needs replacing. There's no need for anyone to enter the tank or loosen any cables, because only VDO/VDE plug connections are used for installation. We stay true to the KLARO principle of using robust SBR processes for lasting customer satisfaction!

[1] At an electricity price of around EUR 0.20/kWh

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Your competent specialist partner

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