



**CLEAR AND
CLEAN WATER
WITH
PEACE OF MIND**

**DO YOU SEE HERE A SAFE & RELIABLE
SEWAGE TREATMENT SYSTEM
THAT IS
INVISIBLE!**

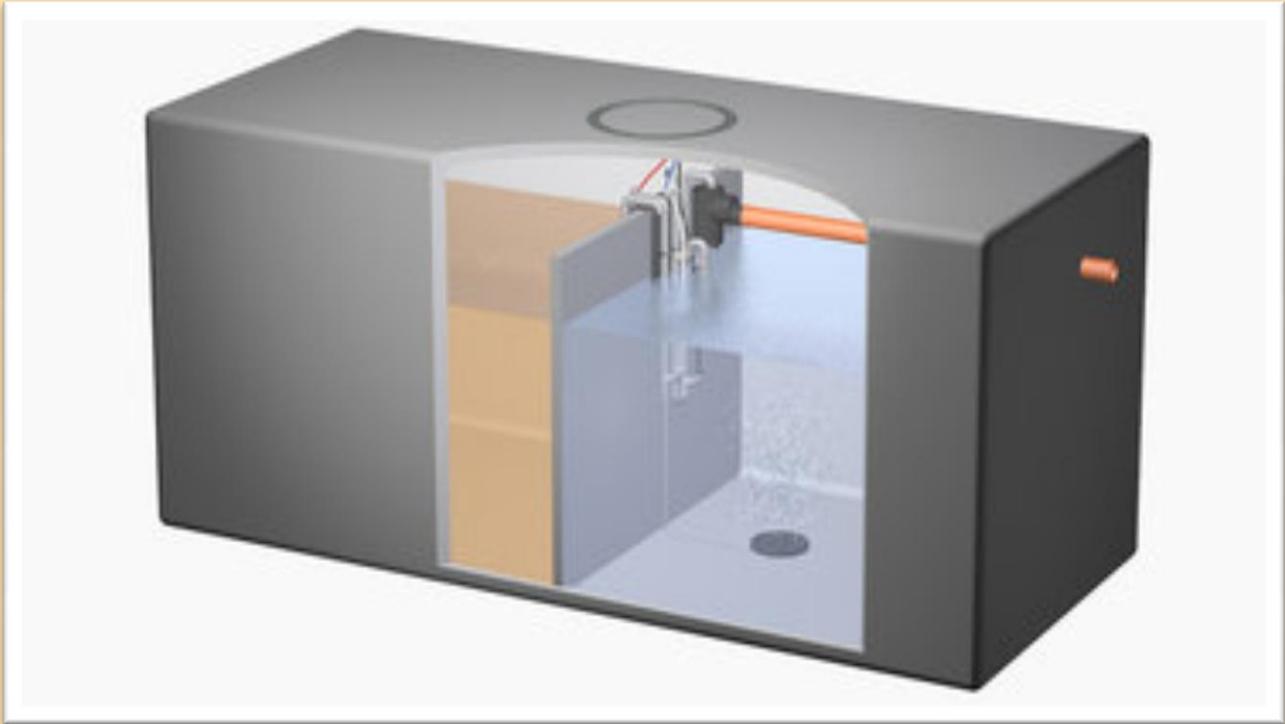
DOES NOT STINK!

NO PUMPS INSIDE!

CONSUMES 50% LESS POWER!

AUTOMATIC REMOTE MONITORING!

NO OPERATOR!



MEETING REGULATORY REQUIREMENTS WITH “PEACE OF MIND”

Treating waste water is more difficult than treating water. Whether it is Sewage water or Industrial waste water, the raw waste water characteristics is not uniform and is unpredictable. It is a big challenge to design a suitable waste water treatment solution that will operate consistently, reliably and cost effectively. Many a time enough information and data is not available to design a suitable system. Under these circumstances the supplier's experience is very important. We at Ionic are determined to provide the right solutions at the right cost. As a corporate commitment to protect environment IONIC offers sewage treatment systems for various types of users. Our experience in dealing with diverse industries makes it possible to offer techno-economically optimum solution for treating sewage waste water.

IONIC is a technology neutral company. In consultation with carefully selected technological partners we are in a position to offer the latest in treatment technologies to protect our environment. Some of the solutions we have provided to our customers are unique and one of the kind in the industry.

We can provide a range of technologies involving SAFF, MBBR, SBR, MBR or conventional activated sludge process etc. to name a few. The choice depends on various factors. Tell us your requirement and leave the rest to IONIC. Our focus is on technology, performance and low life cycle cost of water and waste water treatment systems.

SEWAGE TREATMENT SYSTEMS - SBR

IONIC offers packaged prefabricated fully automatic **Sewage Treatment systems** with SBR (Sequential Bioreactor) technology in a compact form factor under licensing from KLARO, Germany. They are very compact with limited civil work, offer value for your money and “peace of Mind”. Using biological process they reduce organics pollutant by > 90% and makes the treated water safe for recycling for various purposes like gardening or disposal. Various standard configurations available 7 KLD-75 KLD available (4 PE - 1500 PE)

THE SBR METHOD - BACK TO NATURE - THE NATURAL CYCLE.

Every single person uses an average of 130-150 litres of water per day - water which then needs to be treated after use. KLARO small wastewater systems bring domestic wastewater back into nature without posing any kind of risk and therefore harmonizing the natural cycle.

We achieve this aim by means of the SBR method. SBR stands for: Sequencing Batch Reactor



1. Loading phase

The wastewater is initially fed into the sludge tank (1st chamber) where solid constituents are removed. From here, the wastewater is then gradually led into the SBR tank (2nd chamber).

2. Aeration phase

The SBR tank is where the actual biological treatment process takes place. Here, short aeration and rest phases alternate with one another within the scope of a controlled cleaning process. This means that the so-called activated sludge with its millions of micro-organisms can develop and treat the water thoroughly.

3. Rest phase

During the 90-minute rest phase, the activated sludge then settles on the bottom of the tank. A clear water zone forms in the upper part of the SBR tank.

4. Clearwater extraction

The separated clear water is then led from the SBR tank to the receiving water (stream, river or lake) or into a percolation system. Afterwards, the sludge is returned to the first chamber from the SBR tank and the process starts again from the beginning.

EFFLUENT CLASSES / PURIFICATION PERFORMANCE

Future-oriented, state-of-the-art technology.

KLARO technology achieves what others can't. Today, the treated water values reached by KLARO are 70 % lower than required by law. This implies safety for the future - even if the legal requirements for wastewater become stricter in the future.

Wastewater parameter	KLARO Easy drainage values*	Degree of efficiency
COD (chemical oxygen demand)	39 mg/l	94,6 %
BOD ₅ (biochemical oxygen demand)	9 mg/l	97,3 %
NH ₄ -N (ammonium nitrate)	3,8 mg/l	89,9 %
P _{ges} (phosphate removal)	0,4 mg/l	95,0%
SS (suspended solids)	15 mg/l	96,2 %

* Results of the practical test carried out by PIA (Prüfinstitute für Abwassertechnik GmbH), Aachen test number 2011-140B14.



KLARO SEWAGE TREATMENT SYSTEMS ARE TESTED FOR UNDERLOAD

Even with low water consumption KLARO sewage treatment plants ensure highest performance.

The treated waste water is discharged directly into the nature, therefore the stability of a small sewage treatment plant's effluent classes is very important. Alternating loading of the plant (by force of personal, time of day, day of week, seasonal circumstances) can shake this stability - but not with KLARO small wastewater treatment plants.

UNDERLOAD DETECTION AND RECIRCULATION

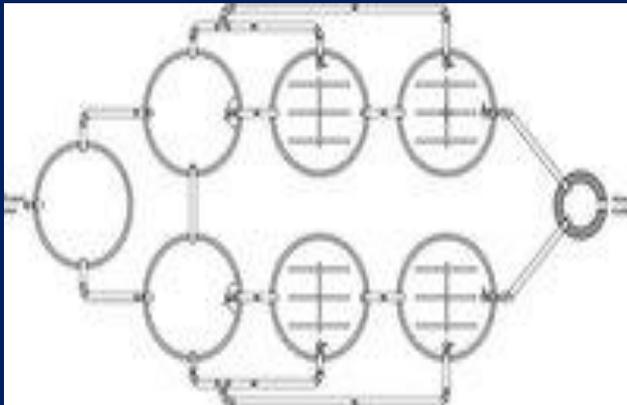
The "KLplus" control mechanism checks the fill level in the first chamber every 6 hours with an integrated pressure sensor. In the event of little or no inflow or low level, a purification cycle is not operated, but the system is merely marginally aerated. So electricity is saved and yet the batteries are preserved. The plant's lifespan is independently adapted to the actual volume of wastewater with the automatic under load detection.

If no purification cycle has been operated three times in succession (i.e. a total break of 18 hours), the mechanism activates the surplus sludge lifter and transports water from the SBR chamber back into the 1st chamber. The duration and quantity is adjustable. Through this recirculation the first chamber fills and a normal purification cycle is started afterwards. Consequently, the batteries are provided with "fodder" once a day.

EXAMPLES OF APPLICATION: UNDERLOAD CONDITIONS

Long-term under-occupancy (single-person household)
Hotels
Very low water consumption
Weekend houses
Holiday homes
Restaurants
Under load in connection with increased requirements

Multiple lines



In extreme cases the plants are installed redundantly with multiple lines. The tanks are then set up in such a way that the biological cleaning takes place in two separate SB reactors. In low-season the SBR tank remains shut down. This is re-commissioned when the high-season begins. Activated sludge is then fed through from the operational tank to the tank that was previously shut down. Therefore, it is 100% operational immediately.

Examples of application:

Camping
Hotels
"Additional feeding"

Feeding a highly concentrated nutrient solution to the bioreactor is additionally possible with only sporadic or seasonal volume of wastewater. The consumption of the agent is minimal. Moreover, this is completely harmless, cost-effective and easy to handle. An adequate quantity of activated sludge, which furthermore features excellent settling properties, can be kept available with this agent.

One is independent from volume of wastewater with this method. Consequently, a KLARO plant can also be employed in cases in which one merely considered a pit without outlet to be possible.

We already have several years of experience with the "additional feeding method", and we will gladly demonstrate various reference objects to you in this connection.

KEY BENEFITS:- Why you should select KLARO?

- 98% cleaning performance in just 6 hours (four cycles per day)
- Variety of sizes to select from 4 PE to 2000+ PE
- High treated effluent quality conforming the tolerance limits of pollution control boards
- A trusted product from a consultant specialist of IONIC
- Total biological treatment without using any chemicals
- Optional - Ultra-violet treatment or Chlorine Dioxide for disinfection
- Ability to install quickly because the equipment is prefabricated
- Container with range of materials; fiberglass, concrete and plastic
- Underground system that is invisible and saves space
- Safe to operate because there are no moving parts in the container (all the pumping operations of the system uses an air lifter)
- energy saving with fine bubble aeration and holiday operation
- Optimum effluent treatment quality. The treatment process cycles in four significant phases.
- Energy saving - the air compressor works only for 10-12 hours a day thus significantly saving energy unlike other biological processes that needs to be aerated for 24 hours.
- **Remote monitoring and Operation with GSM modem**



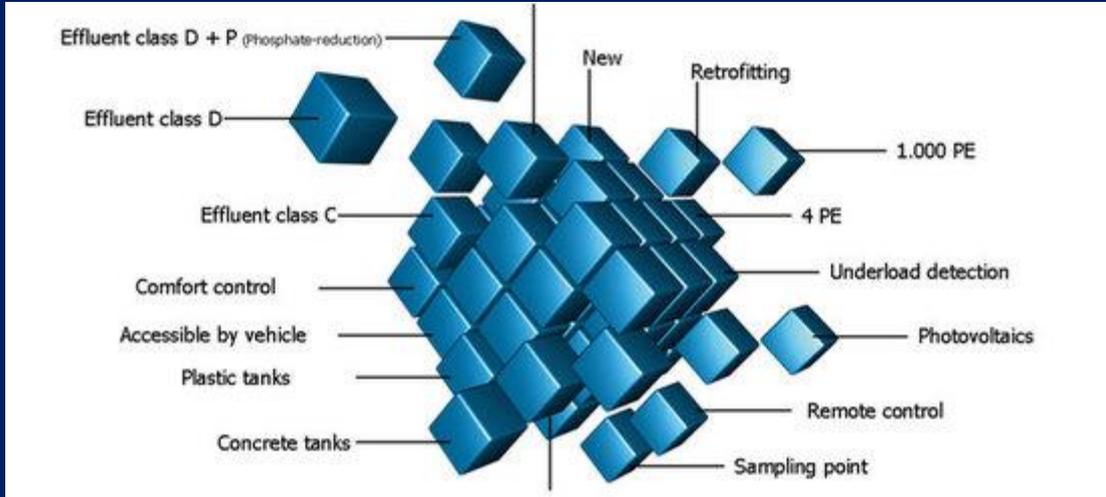
NITROGEN REDUCTION (EFFLUENT CLASSES N AND D)

This IONIC system is designed for the removal of a large portion of the nitrogen in the wastewater. The removal of nitrogen is also a completely biological process, thanks to particular types of micro-organisms. Systems with additional nitrification create particularly great living conditions for nitrifying bacteria, which convert ammonia (NH_4) to nitrate (NO_3). In plants designed for additional denitrification, the circulation of the water is achieved by short aeration periods during the aeration phase, the denitrifying bacteria are activated that transform nitrate (NO_3) into elementary nitrogen (N_2).

Phosphate can also be reduced by implementing phosphates precipitation systems.

FIT FOR THE FUTURE- THANKS TO A MODULAR DESIGN

The small wastewater treatment plant by IONIC can be flexibly adjusted to the requirements of tomorrow. Our cube shows how this is implemented.



The modular design by ensures extraordinary security for the future and your investment. Thus, the small wastewater treatment plant by IONIC can be adjusted to changed requirements.

If necessary, software updates can be used to ensure flexible adjustments.

WE TREAT WATER - "DIFFERENTLY"

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