

# KLARO product line

Sophisticated wastewater treatment plants

Advanced separator systems



No mechanical parts  
in the wastewater



No pumps  
in the wastewater



No electrical parts  
in the wastewater



- ✓ Current European market leader for small waste water treatment plants
- ✓ Experience since 2001
- ✓ Medium sized company in Germany
- ✓ KLARO is a company of the GRAF group since 2014
- ✓ German design and engineering
- ✓ Wastewater treatment plants from 0.6 m<sup>3</sup> / day to 750 m<sup>3</sup> / day (4 - 5.000 PE)
- ✓ Solutions for wastewater reuse
- ✓ Grease- and light fluid separators (NS 1 - 15)

Fermenta Biotech Ltd. is the authorized distributor of KLARO in India. Together, Fermenta and KLARO bring in immense shared values and expertise in engineering techniques for waste water management.

Founded in 1986, Fermenta Biotech Limited offers a comprehensive set of solutions designed to sustainably tackle growing environmental concerns. Apart from a plethora of biotechnology products, we provide a holistic range of services ranging from design, engineering and construction of wastewater treatment plants to end-to-end operation and maintenance services.



**Fermenta Biotech Limited**



... quality



Quality products  
Made in Germany with CE  
certification.

... safety



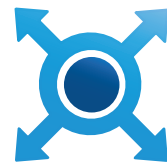
NO mechanical parts, NO  
electrical parts, and NO  
pumps in the wastewater.

... technology



State of the art  
technology, always  
one step ahead.

... flexibility



Adapted to customer re-  
quirements.

... variety



Our systems are flexible,  
easy adaptable and fast to  
assemble.

... development



Awarded with the  
R & D seal of approval.

... eco friendliness



Ecological aware-  
ness. Full biological  
treatment.

... fast production



Standard systems are  
ready for delivery within a  
few days.

# KLARO products in comparison

System	<p style="text-align: center;"><b>KLARO</b></p>  <p style="text-align: center;"><i>More information page 6</i></p>	<p style="text-align: center;"><b>KLARO One</b></p>  <p style="text-align: center;"><i>More information page 8</i></p>	<p style="text-align: center;"><b>KLARO 50+</b></p>  <p style="text-align: center;"><i>More information page 6</i></p>
Treatment capacity	Up to 50 PE (7,5 m³/day)	Up to 50 PE (7,5 m³/day)	50 to 1.500 PE (7,5 to 225 m³/day)
Process	SBR (anaerobic + aerobic)	SBR One (all aerobic)	SBR (anaerobic + aerobic)
Bacteria	Activated sludge	Stabilized activated sludge	Activated sludge
Standard calculated sludge removal intervall	Approx. 6-12 months	Approx. 24 months	Approx. 6 months
Overground installation	✗	✗	✗
Underground installation	✓	✓	✓
Available as packed plant	✓	✓	✗
Retrofitting of one-chamber tanks	✗	✓	✗
Retrofitting of multiple-chamber tanks	✓	✓	✓
Retrofitting of concrete tanks	✓	✓	✓
Retrofitting of plastic/GRP tanks	✓	✓	✓
Modular system	✓	✓	✓

<p><b>KLARO One 50+</b></p>  <p><i>More information page 8</i></p>	<p><b>KLARO MAX</b></p>  <p><i>On request</i></p>	<p><b>KLARO One UP</b></p>  <p><i>More information page 10</i></p>	<p><b>KLARO container.one®</b></p>  <p><i>More information page 11</i></p>
50 to 500 PE (7,5 to 75 m³/day)	1.000 to 5.000 PE (150 to 750 m³/day)	Up to 12 PE (1,8 m³/day)	100 to 200 PE (15 to 30 m³/day)
SBR One (all aerobic)	SBR One (all aerobic)	SBR One (all aerobic)	SBR One (all aerobic)
Stabilized activated sludge	Stabilized activated sludge	Stabilized activated sludge	Stabilized activated sludge
Approx. 24 months	Approx. 1 month	Approx. 24 months	Approx. 3 months
✗	✗	✓	✓
✓	✓	✗	✗
✗	✗	✓	✓
✓	✗	✗	✗
✓	✓	✗	✗
✓	✓	✗	✗
✓	✗	✗	✗
✓	✓	✓	✓

# System KLARO



## Wastewater treatment plant KLARO

available from 4 to 1.500 PE (from 7,5 m<sup>3</sup> to 225 m<sup>3</sup>/day)

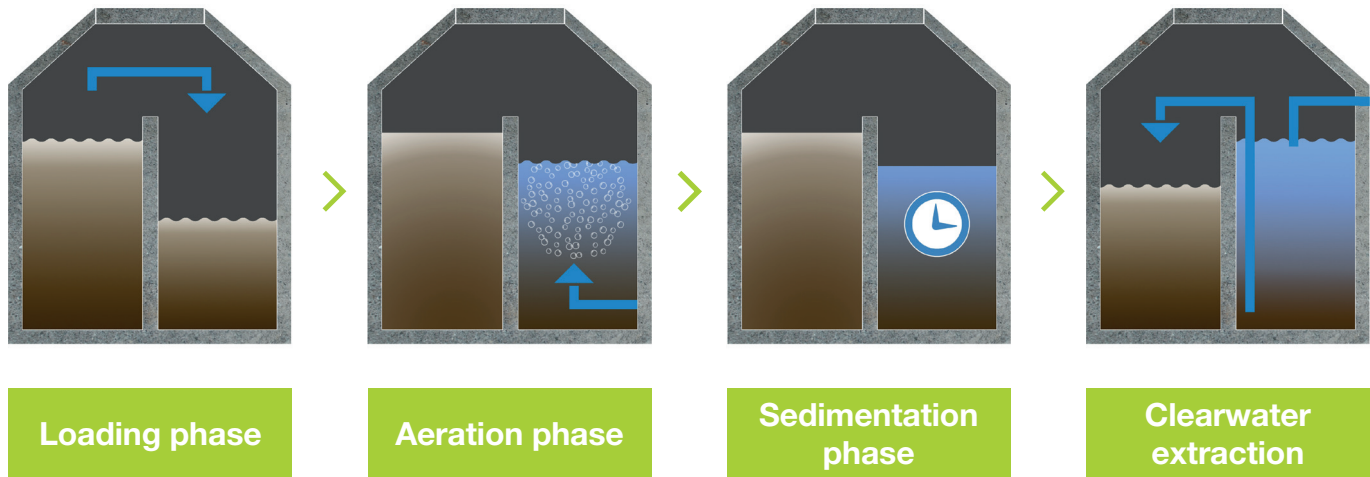
### Advantages and features of the KLARO system

- ✓ For tanks made of concrete, plastic, GRP
- ✓ For installation in existing tanks or new systems
- ✓ Very stable process even in case of hydraulic shock loads or underload
- ✓ Separation of switch cabinet and sewage plant:  
no pumps, no mechanical and no electrical parts in the wastewater
- ✓ Easy maintenance; durable and reliable
- ✓ Can be retrofitted to 2, 3 or 4 chamber pits
- ✓ Simply extendable with additional components (UV module, phosphate removal, ...)
- ✓ Remote control via WebMonitor® possible
- ✓ Features like underload detection \* and vacation mode

#### \*Underload detection :

- KLAROcontrol.S/M checks fill level
- In event of little or no inflow a purification cycle is not operated
- System is marginally aerated to preserve bacteria
- Energy is saved

## Process



[Scan for the KLARO process video](#)

## Effluent values

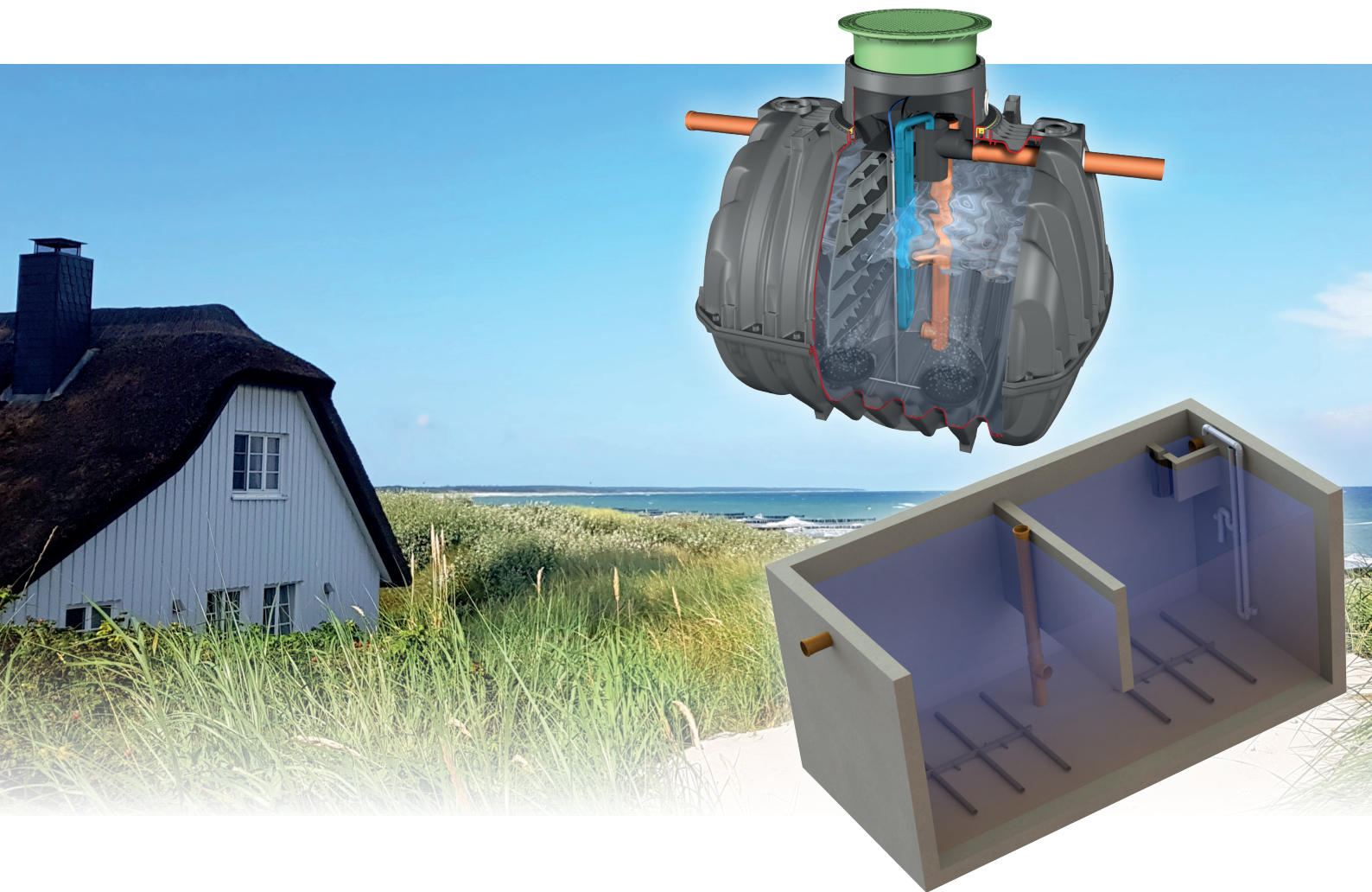
Wastewater parameter	KLARO Easy Effluent values*	Degree of efficiency
COD (chemical oxygen demand)	48 mg/l	92.3 %
BOD <sub>5</sub> (biochemical oxygen demand)	6 mg/l	97.5 %
NH <sub>4</sub> -N (ammonium nitrate)**	8.3 mg/l	75.8 %
N <sub>tot</sub> (total nitrogen)**	16 mg/l	67.5 %
P <sub>tot</sub> (total phosphate)	3.1 mg/l	56.9 %
SS (suspended solids)	7 mg/l	96.7 %



Results of the practical test carried out by PIA (Prüfinstitute für Abwassertechnik GmbH), Aachen test report number PIA2019-349B15.02

\*average effluent values and efficiencies of the plant operation for nominal phases (100%)

\*\* nitrogen characteristics for water temperatures of 12°C and more in the bioreactor



## Wastewater treatment plant KLARO One

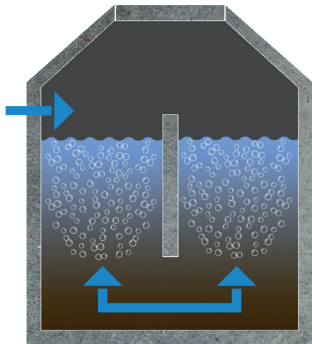
available from 4 to 500 PE (from 7,5 m<sup>3</sup> to 75 m<sup>3</sup>/day)

### Advantages and features of the KLARO One system

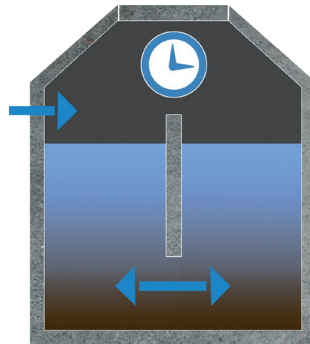
- ✓ Fully aerobic system (no putrid odours)
- ✓ Large buffer, designed for the total daily volume
- ✓ Independent of tank material and geometry
- ✓ Installation in one chamber tank possible
- ✓ Automatic level measurement
- ✓ Excellent effluent values
- ✓ Extended sludge removal intervals
- ✓ Minimal power consumption
- ✓ Minimal maintenance
- ✓ Microprocessor control
- ✓ Plug & Play retrofit kit



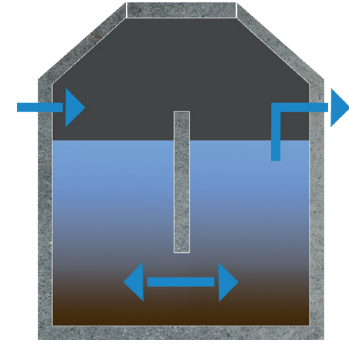
## Process



Aeration phase



Sedimentation phase



Clearwater extraction



[Scan for the KLARO One process video](#)

## Effluent values

Wastewater parameter	KLARO One Effluent values*	Degree of efficiency
COD (chemical oxygen demand)	41 mg/l	94.2 %
BOD <sub>5</sub> (biochemical oxygen demand)	7 mg/l	96.0 %
NH <sub>4</sub> -N (ammonium nitrate)**	0.5 mg/l	96.3 %
N <sub>tot</sub> (total nitrogen)**	7.9 mg/l	87.0 %
P <sub>tot</sub> (total phosphate)	1.6 mg/l	96.3 %
SS (suspended solids)	14 mg/l	96.3 %

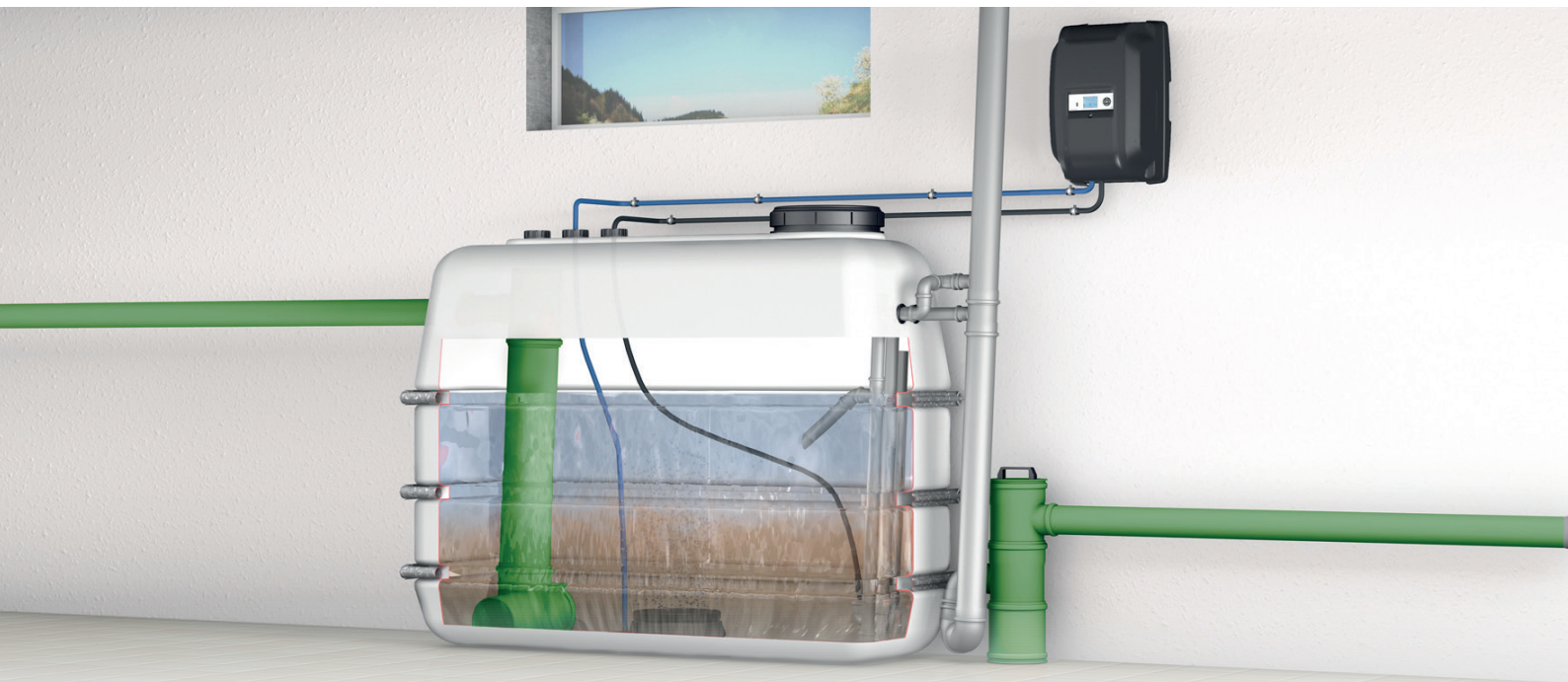


Results of the practical test carried out by PIA (Prüfinstitute für Abwassertechnik GmbH), Aachen test report number PIA2014-216B14.02

\*average effluent values and efficiencies of the plant operation for nominal phases (100%)

\*\* nitrogen characteristics for water temperatures of 12°C and more in the bioreactor

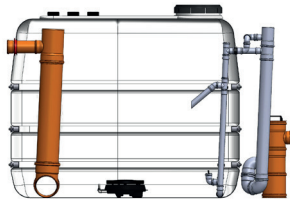
# KLARO Special solutions



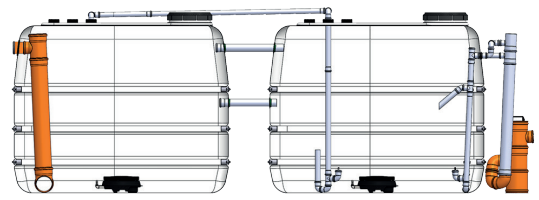
## KLARO One UP

The solution for overground installation up to 12 PE (1,8 m³/day)

### Types of tanks



PE	Qd [l/d]	Bd [g/d]	Tank
3	450	180	2.000L
6	900	360	4.000L



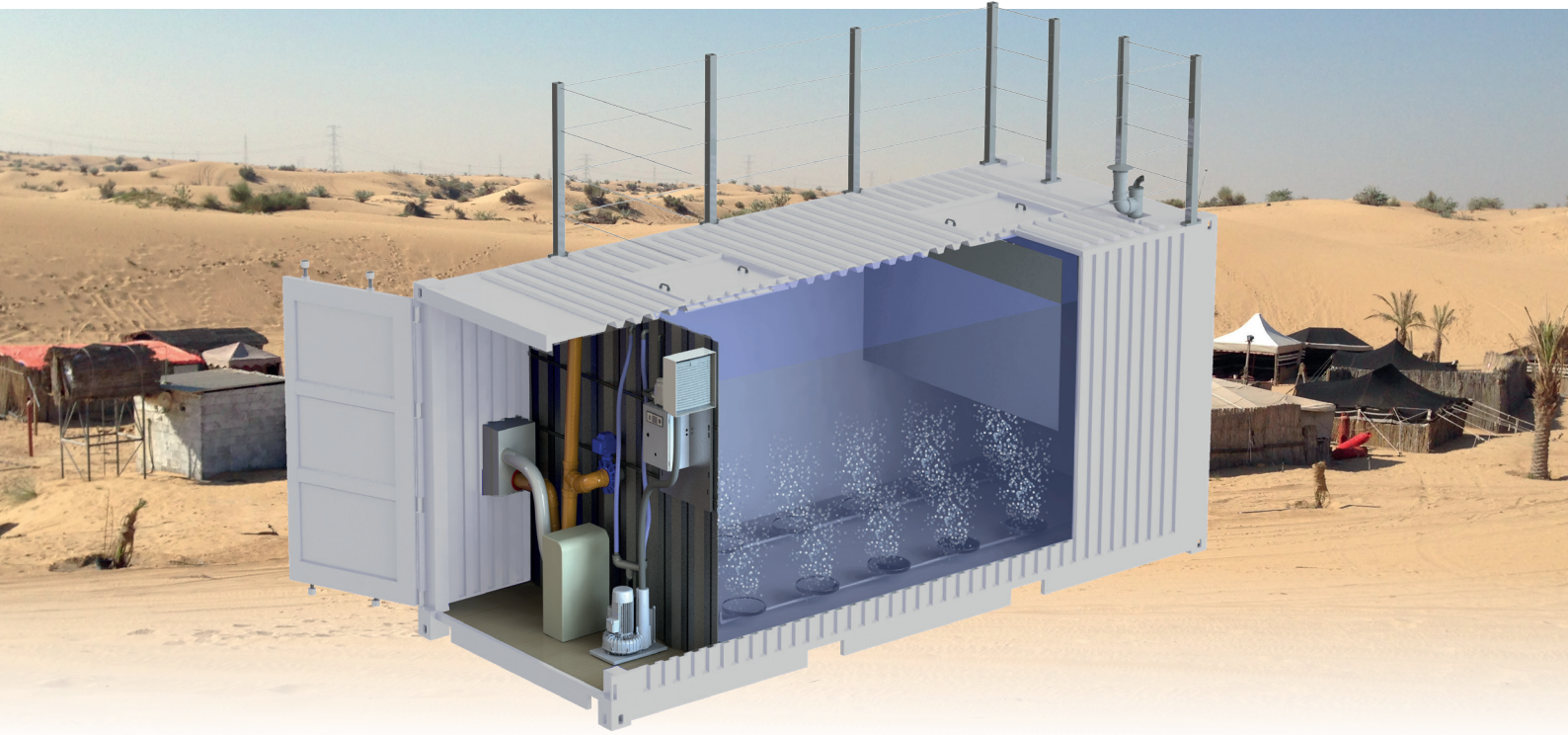
PE	Qd [l/d]	Bd [g/d]	Tank
6	900	360	2x 2.000L
12	1800	720	2x 4.000L

### Advantages and features

- Fully aerated, fully biological treatment system
- Tank made of HDPE
- Above-ground installation
- Small and compact - fits even in tight spaces
- Fits through conventional doors
- For small quantities of wastewater
- UV resistant (optionally available)

### Areas of application

- Where no civil engineering is possible (no access with construction machinery, rock, water)
- Houseboats
- Small commercial enterprises
- Garden house, weekend house, vacation home
- Mobile wastewater treatment plant
- Experimental wastewater treatment plant



## KLARO container.one®

The intelligent mobile wastewater treatment solution up to 200 PE (30 m<sup>3</sup>/day)

KLARO container.one® is the new mobile sewage treatment plant in a standard 20/40 ft container. It is constructed for easy set-up and take-down (plug-and-play). Therefore the container plant is especially suitable for temporary use.

As the technology is installed inside the container it is ideally protected from all weather conditions and furthermore easy to transport.

### Sturdy design

- Complies with the static requirements of EN 1993-1-5, Annex C
- Special, wear-resistant polyurea coating
- Standard A/C unit (EU standard)
- Optionally available with a railing

### Safety

- Tried & tested KLARO ONE concept
- Fully aerated, preventing foul odours
- Easy to use and low-maintenance

### Flexible

- Easy to transport
- Prefabricated and expandable design
- Stackable and transportable
- Suitable for both long-term and temporary use

### Efficiency

- Low energy consumption
- Fully automated and user-friendly
- Wear-resistant components for low maintenance
- Quick to install and remove (plug-and-play)

## Areas of application

- ✓ Moving roadwork sites
- ✓ Worker camps
- ✓ Mining camps

- ✓ Tourist camps
- ✓ Quarries
- ✓ Logging camps

- ✓ Military camps
- ✓ Research camps
- ✓ Refugee camps



scan for container brochure

# KLARO components

**NEW!**

## Controller for all KLARO systems

### Main features of the controller

- ✓ Microprocessor controller, real-time controlled
- ✓ Large graphic display, multi-line, with backlighting
- ✓ Control pad with OK
- ✓ LED status display
- ✓ USB interface for data exchange - read out and upload data, software update
- ✓ Redundancy
- ✓ Level-dependent operation (e.g. underload detection)
- ✓ Manual operation function: loads can be operated individually
- ✓ Measured values can be viewed, e.g. temperature, pressure, water depth, voltage, current consumption
- ✓ 3 operating levels (operator / service / manufacturer)
- ✓ Universally applicable - also for other treatment systems
- ✓ JSON protocol for communication with KLARO WebMonitor or other PLC control, e.g. SCADA



**KLAROcontrol.S**



**KLAROcontrol.M**

## Examples of indoor switch cabinets



**NEW!**

- ✓ 4 to 10 PE
- ✓ Minimal space required:  
40 cm x 54 cm x 29 cm

**PP indoor cabinet**



- ✓ Up to 50 PE
- ✓ Size: 80 cm x 65 cm x 53 cm

**Indoor cabinet 3**

## Examples of outdoor switch cabinets



- ✓ 4 to 10 PE
- ✓ for the extension of the  
I-cabinet PP
- ✓ Size: 45 cm x 142 cm x 40 cm
- ✓ Optional with chemical tank

**PP outdoor cabinet**



- ✓ Up to 200 PE
- ✓ Size: 114 cm x 100 cm x 72 cm

**Outdoor cabinet 4**

## KLARO *airlift*.blue retrofit kit up to 50 PE

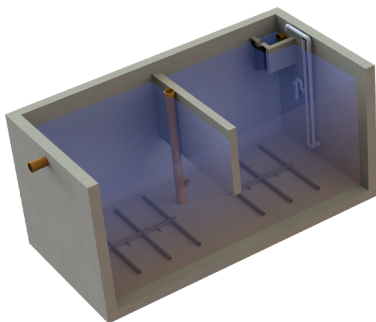
- ☑ Suitable for installation into tanks made of plastic, concrete, etc.
- ☑ Suitable for all new installations and retrofits
- ☑ All transfer processes carried out using compressed air
- ☑ No wear, no blockages
- ☑ All components are made of wastewater- resistant plastic (HDPE) or stainless steel

- |                                      |                                 |
|--------------------------------------|---------------------------------|
| <p><b>1</b> Air connections</p>      | <p><b>3</b> Adjustable feed</p> |
| <p><b>2</b> Patented air barrier</p> | <p><b>4</b> Inflow chicane</p>  |

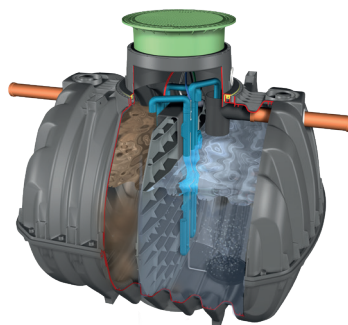


## Tanks (not delivered by KLARO)

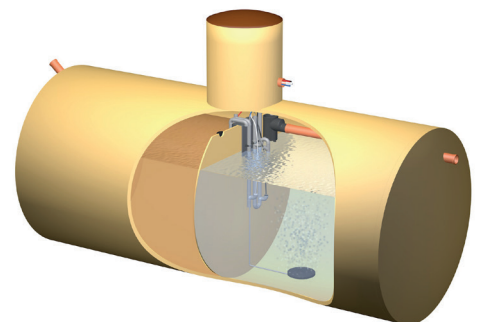
Onsite concrete



Plastic tanks



GRP tanks



## Advantages

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>☑ Installation in new or existing tanks</li> <li>☑ Various materials (concrete, plastic, GRP ...)</li> </ul> | <ul style="list-style-type: none"> <li>☑ For every tank geometry (round, rectangular ...)</li> <li>☑ Retrofitting for 1-, 2-, 3- or 4-chamber pits</li> </ul> |
|---|---|

# KLARO from 50 PE/7.5 m<sup>3</sup> – 5.000 PE/750 m<sup>3</sup> per day



## Individual projects

Systems for more than 50 inhabitants / 7.5 m<sup>3</sup> work on the same principle as small wastewater treatment systems and use the SBR process. Because of the special requirements involved, all systems for more than 50 inhabitants / 7.5 m<sup>3</sup> are planned as individual projects. Our experienced team of engineers and technicians will help you to plan your project. We take all local circumstances into account from the concept planning phase to implementation.

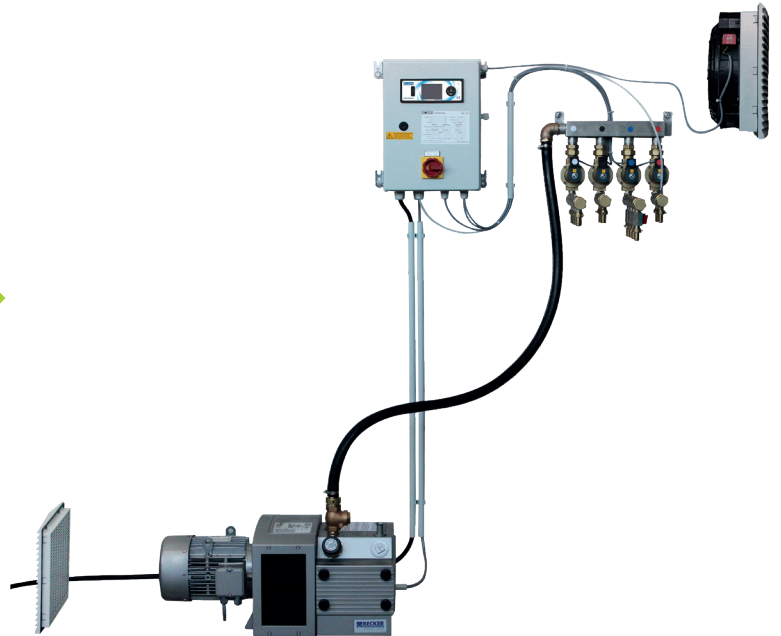


## Multiple lines

- ✓ Can be installed with multiple lines
- ✓ Multiple lines are meaningful for projects with seasonal fluctuations (hotels, campsites)
- ✓ Lines can be switched off during low season to prevent underload and save energy

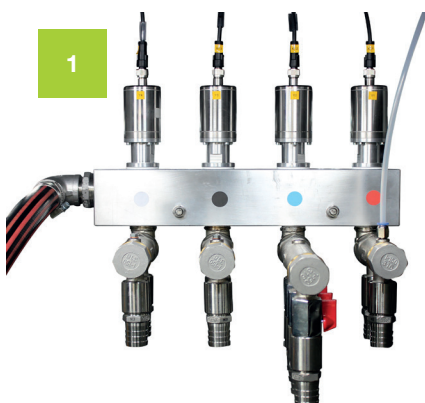
## Machine technology

- ✓ Alternative to a conventional control cabinet
- ✓ Technical components can be installed in a dedicated room or machine house
- ✓ Sufficient space for components
- ✓ Maximum flexibility



### Outdoor cabinet 4

- ✓ Size:  
120 x 111 x 80 cm
- ✓ Empty weight:  
140 kg



### Step motors replace solenoid valves

- ✓ Nearly maintenance free
- ✓ Control with 24V DC
- ✓ Almost noiseless
- ✓ Minimum power consumption

More information can be found in our brochure for „Individual wastewater solutions for up to 750 m<sup>3</sup>/d“.





## KLARO WebMonitor® - the intelligent remote control

The KLARO WebMonitor® is an internet portal that gives maintenance companies and operators the option to monitor small wastewater treatment plants online, regardless of where they are. The small sewage treatment plant is queried everyday and reports automatically when something isn't right - definitely!

### The KLARO WebMonitor® provides ...

- ✓ Increased customer benefit through monitoring service
- ✓ Cost-effective remote diagnosis in case of malfunctions
- ✓ Higher effectiveness
- ✓ Higher operational reliability
- ✓ Optimized service intervals

### Operation via Internet

- ✓ No monitoring on-site
- ✓ Automatic data storage
- ✓ Monitoring when absent
- ✓ Remote of outdoor cabinets

### Advantages for the partner

- ✓ Overview of all plants
- ✓ Direct access via internet
- ✓ Email-notification in the case of an error
- ✓ Continuous automatic monitoring



## UV module

*For disinfection*

For sensitive zones with high requirements in terms of environmental protection, an additional UV module can be installed. For clear water extraction, the outflow water is intensively irradiated with UV light. This inactivates the resulting bacteria which die off within a few seconds.

- For sensitive zones with high requirements
- Low operating costs
- Simple, retrofittable
- Can be integrated into a tank



## Phosphate pump

*For phosphorous elimination*

The phosphate content of the wastewater is regulated by implementing a dosing pump which releases a special precipitant. The precipitant creates an insoluble compound with the phosphate, which settles well in the tank. This variation has also been tested and approved for application in sensitive areas.

- Cleaning performance tested and certified
- Easy to maintain
- Long life span
- Retrofitting possible



## Carbon pump

*For carbon dosing*

Carbon can be added to the activated sludge stage to compensate for a nutrient deficiency. This can be problem-solving in the case of extreme underload phases or unfavorable wastewater composition.

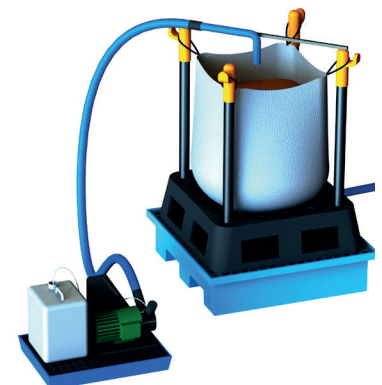
- Simple and efficient
- Many years of practical experience
- Supplementary component
- Especially for holiday homes, hotels and seasonal accommodation



## Sludge dewatering

*For dewatering of excess activated sludge*

- Reduction of sludge mass, volume and disposal costs
- Good for remote places with no availability for desludging
- Simple and save handling; 10 m<sup>3</sup> sludge in one filter bag
- Dried sludge can be used for composting



## Additional components



### KLARO blue.cycle®

One of the biggest challenges in waste water treatment today is finding solutions for reusing the treated water. The goal is for water used in sewage treatment plants to be put directly to use, e.g. for watering gardens.

KLARO blue.cycle® is the result of a long and intensive period of development by KLARO and stands for innovative solutions for disinfection and reuse, designed as an extension for sewage treatment plants.

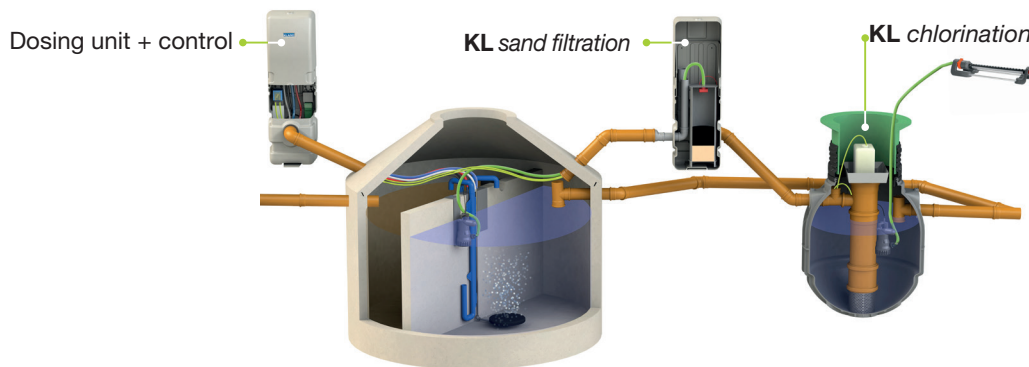
The KLARO blue.cycle concept is based on a chlorination process. Chlorination is the worldwide most established method for the effective kill of many pathogens present in wastewater and inhibits their regrowth through its long term effect.



## KL reuse

The system KL reuse consists of the proven KL sand filtration and KL chlorination. The combination of both processes guarantees the optimum treatment to reuse the treated water e.g. for irrigation. The secondary effluent is first filtrated by the KL sand filtration, followed by a chemical disinfection by the KL chlorination in the disinfection tank. Suspended solids are removed, E.coli are killed.

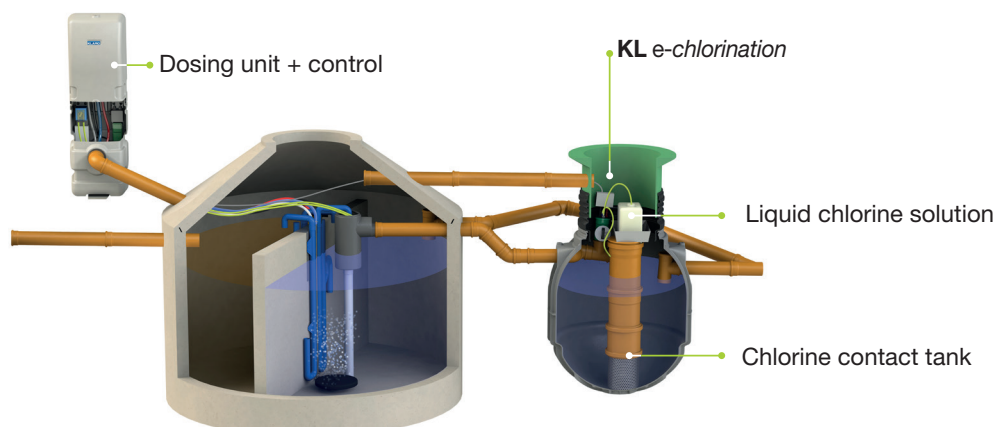
- ✔ Dual media filter for very effective filtration
- ✔ Automatic backwash system for sand filter
- ✔ Further reduction of COD and BOD
- ✔ Very small non harmful doze of liquid chlorine, chlorine dosing timed with batch arrival
- ✔ Possible up to 40 PE or 80 PE (with two-lines)
- ✔ Officially tested according to EN 12566-7



## KL e-chlorination

The System KL e-chlorination was especially developed for bigger applications and can be used up to 500 PE with one module. The module uses electrodes, which activate the chlorine dosing if it's needed. The system has no connection to the controller and is mounted in the disinfection tank. The KL e-chlorination can be installed after a SBR-plant or a continuous running system.

- ✔ Chlorination with well available liquid sodium hypochlorite solution
- ✔ Chlorine dosing only if water passes the electrodes to avoid overdosing
- ✔ Easy maintenance
- ✔ Total coliforms will be nearly completely killed
- ✔ Modular principle: one module up to 500 PE (75 m<sup>3</sup>/day) – easy upscaling with parallel connection
- ✔ No electric parts or submersible pump in the bio reactor necessary





370 PE / 55 KLD Vasudhara Dairy, Boisar



40 PE / 6 KLD Ice cream factory



1.8 KLD Holiday home, Karjat



1.2 KLD - Single house, Coonor, Tamil Nadu



367 PE Milk production - India



3 PE Animal shelter - Germany



150 PE Restaurant - New Caledonia



200 PE Stadium - Rwanda



51 PE Worker camp - Oman



50 PE School - Uruguay



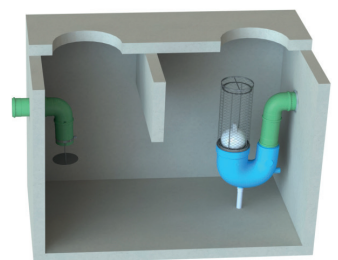
## KLARO light fluid separator unit (class I & II)

In sites where wastewater containing oil and petrol accumulates, the wastewater must be cleaned through a light fluid separator before it can be discharged into the drain. The system consists of a plastic tank with a separation zone, an oil collector, a sludge trap and a sampling point (optional). The light fluid separators are available as petrol separators (KLsepa.compact) or as coalescence separators (KLsepa.compact+).

## KLARO light fluid separation retrofit-kit (class I & II)

Caused by the flexibility of the KLARO separation technology, it can also be used for prefabricated concrete and GRP-tanks as well as for on-site concrete tanks.

With this separation unit, we are able to meet the requirements of customers, who already have the necessary tank for their separator. The retrofit-kit can fit in round and rectangular tanks observing a few parameters.



### Light fluid separator

- Available as petrol separator (class II) or as coalescence separator (class I)
- Compact separator, compact size
- Up to NS 15 (nominal flow rate 15 l/second)
- High quality plastic tank (very lightweight)
- Inlet and outflow made of consistent KG 2000

### Area of application

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Workshops           | <input checked="" type="checkbox"/> Vehicle fleets |
| <input checked="" type="checkbox"/> Petrol stations     | <input checked="" type="checkbox"/> Tank storage   |
| <input checked="" type="checkbox"/> Car wash facilities | <input checked="" type="checkbox"/> Parking spaces |

### Accessories:

Sludge collector, warning systems, external sampling shaft, integrated sampling port

Effectiveness according to EN 858 tested by the TÜV Rheinland, Germany.



## Grease separator

In sites where wastewater containing further fat accumulates, the wastewater must be cleaned through a grease separator before it can be discharged into the drain or a treatment system. A grease separator operates according to the principle of phase separation. It consists of a plastic tank with a separation zone, a fat collector, a sludge trap and a sampling point (optional).

### Grease separator

- Separates wastewater from organic grease and oil
- Compact separator, compact size
- Up to NS 15 (nominal flow rate 15 l/second)
- High quality plastic tank (very lightweight)
- No degradable inner lining
- Low maintenance cost with easy clean inner surface
- Large grease collector

### Area of application

- Restaurant and commercial kitchen
- Butcher shops
- Slaughter houses
- Canning factories
- Dairy farmer
- Oil refineries
- Food factories

### Accessories:

Internal sampling port, external sampling shaft, warning system

Effectiveness according to EN 1825 tested by the TÜV Rheinland, Germany.

## Address



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