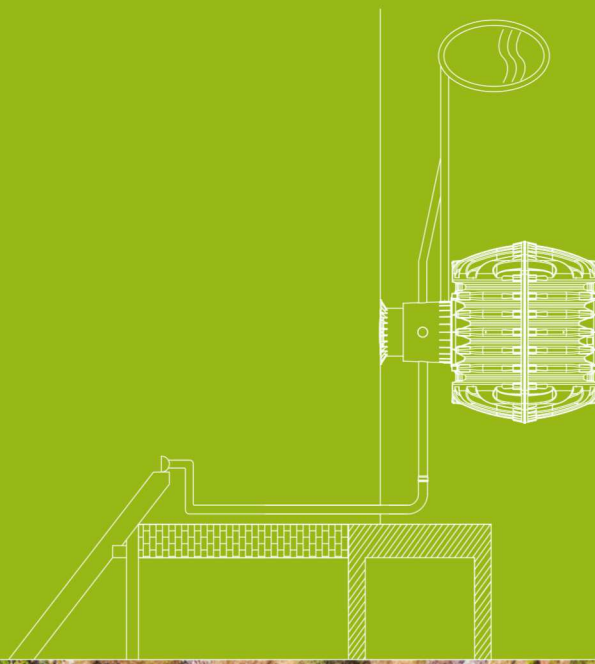


Small Biological Wastewater Treatment System

- > one2clean / one2clean plus
- > Klaro E Professional
- > Klaro E Professional for retrofitting
- > Accessories

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System Comparison

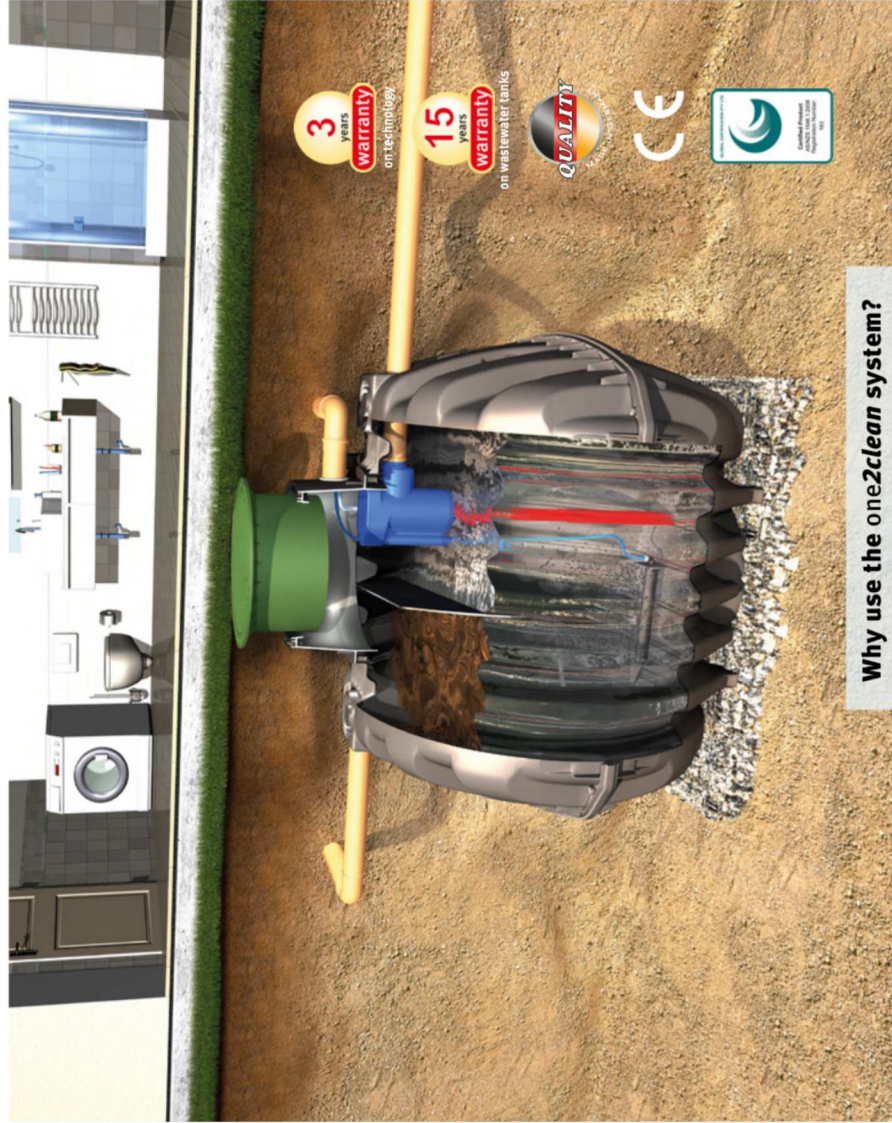


System	one2clean plus		Klaro E Professional KL24base		Klaro E Professional KL24plus	
	10	16	10	16	10	16
System conformity	EN 12566-3	EN 12566-3	EN 12566-3	EN 12566-3	EN 12566-3	EN 12566-3
Purifying technology	fully biological SBR lifting technology	fully biological SBR lifting technology	fully biological SBR lifting technology	fully biological SBR lifting technology	fully biological SBR lifting technology	fully biological SBR lifting technology
One-tank systems available up to	9 inhabitants	9 inhabitants	9 inhabitants	9 inhabitants	9 inhabitants	9 inhabitants
Multitank systems available up to	18 inhabitants	18 inhabitants	18 inhabitants	50 inhabitants	50 inhabitants	50 inhabitants
Maintenance interval	1-2 per year	1-2 per year	1-2 per year	1-2 per year	1-2 per year	1-2 per year
Warranty for underground tank	15 years	15 years	15 years	15 years	15 years	15 years
Warranty for purifying technology	3 years	3 years	3 years	3 years	3 years	3 years
Control						
+K Holiday/economy mode (underload detection)	—	●	—	—	—	●
+R Remote transmission controlled by GSM (GPRS, GPRS as option) or LAN	—	○	—	—	—	○
+P Phosphate removal	—	○	—	—	—	○
+C Carbon infeed	—	○	—	—	—	○
+H Hygiene package (Disinfection)	—	○	—	—	—	○
+D Removal of nitrogen	●	○	—	—	—	○
+E Buffer pump for short-term peak loads	—	—	—	—	—	—
+O Outlet with clear water pump	—	○	—	—	—	○
Control power failure recognition	—	○	—	—	—	○
Temperature sensor to protect against overheating	—	●	—	—	—	●
Logbook function	●	●	●	●	●	●
Operation	4 keys	14 keys	4 keys	4 keys	4 keys	14 keys
Serial interface for software updates	—	●	—	●	—	●
External control cabinet for installing control unit outdoors	○	○	○	○	○	○
Annual power consumption	188 kWh (5 inhabitants)	750 l/d)	358 kWh (5 inhabitants)	750 l/d)	349 kWh (8 inhabitants)	1,200 l/h)
● Standard equipment ○ Available as options — Not available						
Parameter	Cleaning performance for one2clean	Cleaning performance for one2clean plus	Cleaning performance for Klaro E Professional KL24base	Cleaning performance for Klaro E Professional KL24plus		
COD (chemical oxygen demand)	94.2 %	94.7 %	91.9 %	93.1 %	47 mg/l	
EO ₂ (biochemical oxygen demand)	98.0 %	98.1 %	95.9 %	96.9 %	10 mg/l	
SS (suspended solids)	96.3 %	95.7 %	94.4 %	96.9 %	11 mg/l	
NH ₄ -N	98.3 %	88.7 %	65.6 %	74.7 %	11 mg/l	
N _{total}	87.0 %	86.8 %	57.1 %	69.9 %	21 mg/l	
P _{total}	—	95.1 %	—	94.5 %	0.4 mg/l	
eColi	—	99.9 %	—	99.9 %	—	

Results of practical testing undertaken by the Fraunhofer IPT (Testing Institute for Wastewater Technology), Aachen

one2clean / one2clean plus – Facts

3 – 18 PE (450 – 2,700 l/day)



Why use the one2clean system?

As much technology as necessary, as little technology as possible.

Over the past few years, wastewater treatment systems have experienced impressive technological developments. Today, they are high-tech products equipped with sophisticated controls and various pumps, sensors and valves. Yet this is often to the detriment of the product's reliability. A reliable wastewater disposal system no longer needs to be complicated. one2clean is an advanced development of the proven SBR wastewater treatment technology, with considerable advantages in terms of operating costs and safety.

- **Excellent cleaning performance**
Even during load fluctuations and underload
- **Great value for money**
- **Double sludge storage volume**
- **Low sludge removal**

one2clean is a clean solution



12h
Cycle time

1. Aeration phase
The wastewater arrives directly in the biological zone without the need for pumping processes. Aeration of the entire container leads to immediate wastewater activation. The micro-organisms begin the biological cleaning process without delay.



3. Clear water extraction phase
The treated clear water is extracted from the system and the cleaning process can begin once more.



2. Settling phase
Aeration is interrupted by the control unit, the activated sludge sinks to the bottom. A clear water zone develops in the upper part of the container.



one2clean only needs 3 steps to produce clear water
The wastewater treatment is carried out in one chamber in just one tank. This eliminates unnecessary pumping processes and sludge return.

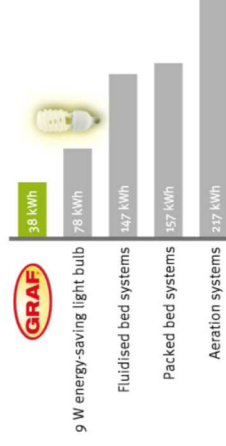
one2clean is odourless
The entire volume of wastewater is immediately activated with oxygen using the unique one2clean technology. The final process of the one2clean produces an odourless, clear treated water for extraction to soakaway or waterway*.

one2clean already meets the needs of tomorrow
The one2clean wastewater treatment system can achieve sustainable discharge values with an efficiency factor of up to 99%. This offers high investment security – even if legal requirements become stricter.

✓ Minimal power consumption



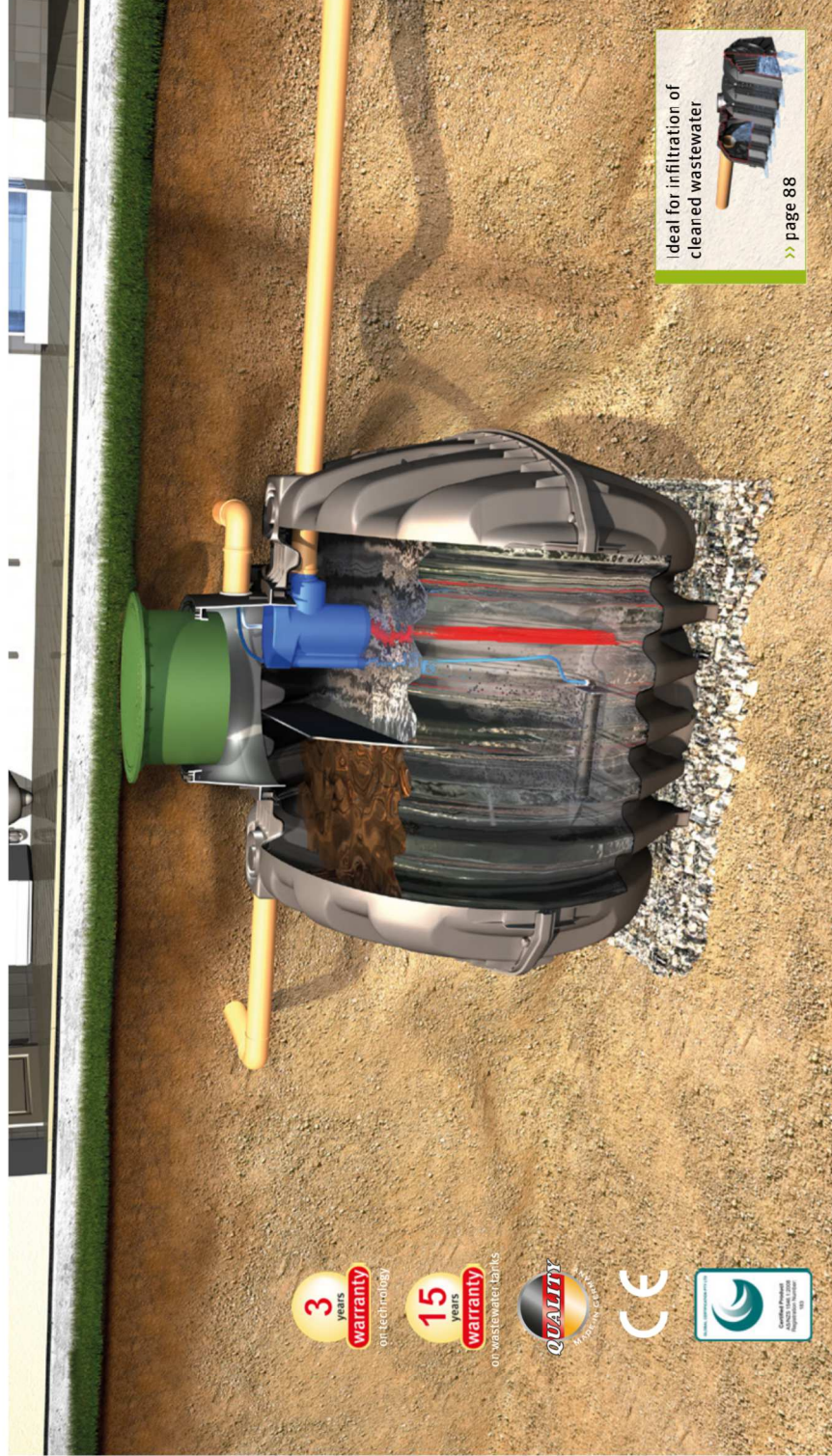
Only 38 kWh per person and per year!



* Manufacturer's operating and installation instructions must be adhered to.

one2clean / one2clean plus

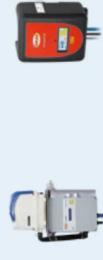
One-tank and two-tank systems



Ideal for infiltration of cleaned wastewater
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Technical data



System	one2clean	one2clean plus
System conformity	EN 12566-3	EN 12566-3
Purifying technology	fully biological SER lifting technology	fully biological SER lifting technology
One-tank systems available up to	9 inhabitants	9 inhabitants
Two-tank systems available up to	18 inhabitants	18 inhabitants
Maintenance interval	1-2 per year	1-2 per year
Warranty for underground tank	15 years	15 years
Warranty for purifying technology	3 years	3 years

Parameter	one2clean	one2clean plus
COD (chemical oxygen demand)	94.2%	94.7%
BOD ₅ (biochemical oxygen demand)	98.0%	98.1%
SS (suspended solids)	96.3%	95.7%
N _{total}	98.3%	88.7%
P _{total}	7.9 mg/l	9.1 mg/l
eColi	-	95.1%
	-	99.9%

Results of practical testing undertaken by the Prüfinstitut für Abwassertechnik (Testing Institute for Wastewater Technology), Aachen

Accessories:

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One-tank system one2clean / one2clean plus

Inhabitants [max.]	Max. daily flow [l/d]	Max. organic load [kg BOD ₅ /d]	Total volume [l]	Volume [l]	Length* [mm]	Width* [mm]	Height [mm]	Weight [kg]
1-3	450	0.18	2,700	2,700	2080	1556	1690	120
4-5	750	0.3	3,750	3,750	2280	1755	1880	150
6-7	1,050	0.42	4,800	4,800	2280	1985	2110	185
8-9	1,350	0.54	6,500	6,500	2390	2190	2390	220

Scope of supply: Carat RS underground tank, tank dome, telescopic dome shaft, one2clean system pack for one-tank system
 (⊗ Page 74 – the GRAF modular system). Please order the air hoses separately (⊗ page 29). * Total measurement

Two-tank system one2clean / one2clean plus

Inhabitants [max.]	Max. daily flow [l/d]	Max. organic load [kg BOD ₅ /d]	Total volume [l]	Volume [l]	Length* [mm]	Width* [mm]	Height [mm]	Weight [kg]
2-7	1,050	0.42	5,400	2 x 2,700	4760	1556	1690	240
8-10	1,500	0.6	7,500	2 x 3,750	5160	1755	1880	300
11-14	2,100	0.84	9,600	2 x 4,800	5160	1985	2110	370
15-18	2,700	1.08	13,000	2 x 6,500	5380	2190	2390	440

Scope of supply: Carat RS underground tanks, tank domes, telescopic dome shafts, one2clean system pack for two-tank system
 (⊗ page 74 – the GRAF modular system). Please order the air hoses separately (⊗ page 29). * Total measurement

Additional modules

+K and +D modules included



Hygiene modules



Remote transmission modules

one2clean / one2clean plus

The advanced wastewater treatment technology

EFFICIENCY FACTOR OF UP TO 99%



Components and Benefits

Covers

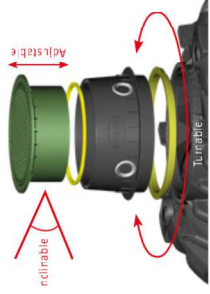
- Suitable for pedestrian or vehicle loading
- Adjustable in height
- Inclinable up to 5°
- » page 80



- ✓ Enables fast ground installation
- ✓ Nice looking cover
- ✓ Allows small corrections of height on-site
- ✓ Reduction of installation cost

Wastewater tank

- State-of-the-art manufacturing for maximum stability
- 100% watertight and corrosion-resistant
- Can be mounted in groundwater
- Unique fit accuracy of the component



- ✓ Self-anchoring saves installation costs
- ✓ Up to 12 to loading, enables installation under car park (flexible choice of location)
- ✓ Tank made of 100% recycling material, environmentally friendly invest

Installation kit

- Only one clear water lifter
- Rugged clear water lifter manufactured in one seamless piece
- Simple maintenance via an integrated, self-cleaning sampling container
- No electrical part in the tank



- ✓ Fast installation
- ✓ Saves installation costs
- ✓ Keeps service costs to a minimum
- ✓ Easy access for service company

one2clean / one2clean plus control cabinets

- Simple handling thanks to micro-processor control
- Energy-saving
- Extremely quiet
- Battery-free power failure detection (for one2clean plus)
- Just one tank with one chamber needed



- ✓ Incredible cost saving due to very low power consumption
- ✓ System can be easily adjusted if required which will reduce costs for technician

Conventional wastewater treatment systems



- ✓ Incredibly little sewage sludge
- Reduces running costs
- Keeps environment clean
- ✓ Flexible selection of the control cabinet's position



Klaro E Professional – Facts

16 – 50 PE (2,400 – 7,500 l/day)

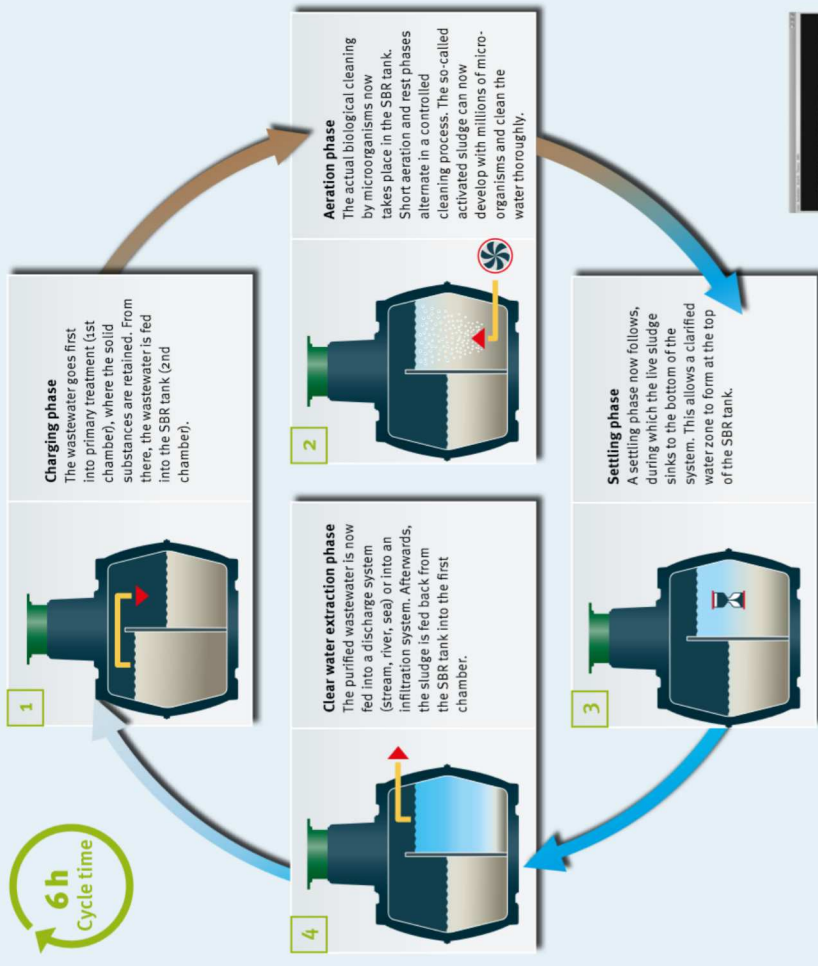


Why use the SBR system?

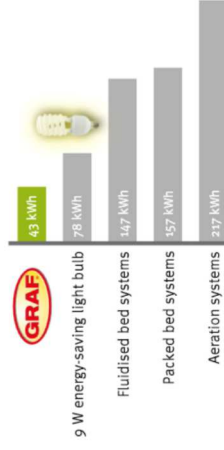
- **Outstanding cleaning performance**
Even during load fluctuations and underload
- **Excellent value for money**
- **Only 2 chambers required**
- **Only a small tank volume required**
- **Can be retrofitted in existing tanks**

How does SBR technology work?

Sequencing batch reactors or SBRs use a separate pre-treatment section to mechanically hold back solids and a biological aeration and settling tank. Small SBR wastewater treatment systems clean incoming wastewater over a number of cycles. GRAF products achieve a cleaning performance of up to 98%. In this respect the GRAF Klaro E Professional far surpasses legal minimum requirements.



Function of the SBR wastewater treatment system Klaro
GRAF TV
www.graf-water.com/graf-tv



Minimal power consumption per inhabitant²⁾

¹⁾The diagram shows the annual power consumption of various treatment systems per inhabitant equivalent. Source: wtr magazine, edition 6/2007 "Die Klärkläranlage als Dauerlösung", page 15, table 3, practical data; Klaro E Professional: Calculated running costs based on a 8 PE treatment plant.



Klaro E Professional

Multitank system



Technical data

System Klaro E Professional	KLz4base	KLz4plus
System conformity	EN 12566-3	EN 12566-3
Purifying technology	fully biological SER lifting technology	fully biological SER lifting technology
Multitank systems available up to	50 inhabitants	7,500 l/d
Maintenance interval	1 – 2 per year	1 – 2 per year
Warranty for underground tank	15 years	15 years
Warranty for purifying technology	3 years	3 years

Parameter	KLz4base	KLz4plus
COD (chemical oxygen demand)	93.1%	93.1%
BOD ₅ (biochemical oxygen demand)	95.9%	96.9%
SS (suspended solids)	94.4%	96.9%
N _{Tot}	65.6%	74.7%
N _{org}	57.1%	69.9%
P _{Tot}	–	94.5%
eColi	–	95.9%

Results of practical testing undertaken by the Prüfinstitut für Abwassertechnik (Testing Institute for Wastewater Technology), Aachen

Accessories

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Klaro E Professional multitank system

Q Webcode C5103

Inhabitants [max.]	Max. daily flow [l/d]	Max. organic load [kg BOD ₅ /d]	Total volume [l]	Volume [l]	Length* [mm]	Width* [mm]	Height [mm]	Weight [kg]
16 – 22	3,300	1.32	9600	2 x 4,800	5160	1985	2430	185
20 – 28	4,200	1.68	13,000	2 x 6,500	5380	2190	2710	220
25 – 32	4,800	1.92	15,000	4 x 3,750	10700	2000	2200	300
32 – 44	6,600	2.64	19,200	4 x 4,800	11100	2200	2430	370
42 – 50	7,500	3.00	26,000	4 x 6,500	11100	2200	2710	440

Scope of supply: CaratRS underground tanks, tank domes, telescopic dome shafts, Klaro E Professional system pack for multitank system (⊕ Page 74 – the GRAF modular system). Please order the air hoses separately (⊕ Page 31). * Total measurement

Additional modules

- +K** Convenience module
- +C** Carbon infeed module
- +O** Pump-operated outlet module

- +D** Denitrification module
- +H** Hygiene modules
- +B** Module buffer pump for short-term peak loads

- +P** Phosphate removal module
- +R** Nitrate removal modules

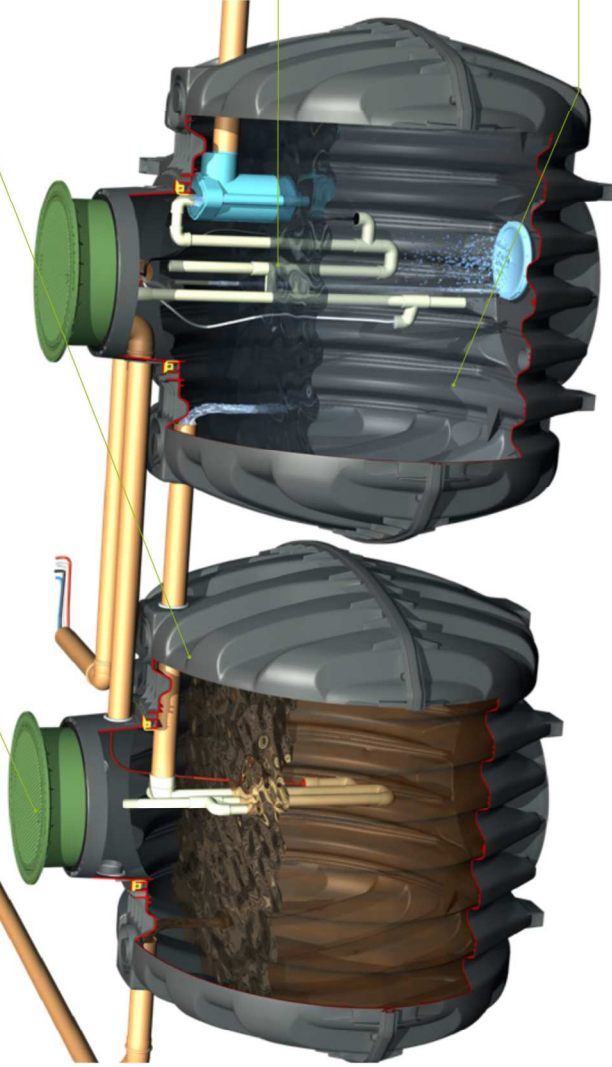
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Klaro E Professional

The classic wastewater treatment technology

EFFICIENCY FACTOR OF UP TO 98%



Components and Benefits



Covers

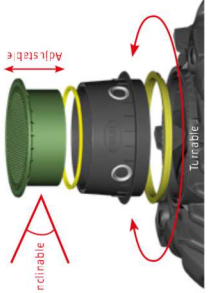
- Suitable for pedestrian or vehicle loading
- Adjustable in height
- Inclinable up to 5°
- >> page 80



- ✓ Enables fast ground installation
- ✓ Nice looking cover
- ✓ Allows small corrections of height on-site
- ✓ Reduction of installation cost

Wastewater tank

- State-of-the-art manufacturing for maximum stability
- 100% watertight and corrosion-resistant
- Can be mounted in groundwater
- Unique fit accuracy of the component



- ✓ Self-factoring saves installation costs
- ✓ Up to 12 to loading, enables installation under car park (flexible choice of location)
- ✓ Tank made of 100% recycling material, environmentally friendly invest

Installation kit

- Simple maintenance set-up kit can be easily installed and removed
- No electrical part in the tank
- Integrated air-lock-barrier prevent untreated water to enter the clearwater airlift
- Higher outflow through the tank dome can be realized



- ✓ Fast installation
- ✓ Saves installation costs
- ✓ Keeps service costs to a minimum
- ✓ Easy access for service company

Klaro E Professional control cabinets

- Simple handling thanks to micro-processor control
- Energy-saving
- Extremely quiet
- Battery-free power failure detection



- ✓ Incredible cost saving due to very low power consumption
- ✓ System can be easily adjusted if required which will reduce costs for technician
- ✓ More comfortability at home (with Kl24tplus)
 - Automatic holiday mode
 - System adjust itself by changing life situation