Wastewater Treatment Solutions

WASTEWATER TREATMENT SYSTEMS
SEPTIC TANKS  CESSPOOLS INFILTRATION
Pure, clean water is one of our most important resources. GRAF develops, manufactures and markets an extensive range of products for water management. GRAF provides solutions to global challenges, such as protecting watercourses or preventing flooding, with typical German quality.

Active in over 70 countries, with roots in Germany
GRAF products are exported to more than 70 countries around the world. Despite being highly active abroad, GRAF is also continually investing in its headquarters at Teningen. By constructing its raw materials competence centre in Herbolzheim, GRAF is expanding its German roots yet further.

Sustainably manufactured environmental products
GRAF environmental products are 100% recyclable and are designed for as long a life as possible. This ensures that fewer resources are used and the environmental impact is minimised. Right from the stage of developing its products, GRAF attaches great importance to sustainable product design. Through years of intensive research, GRAF has managed to replace 70% of the raw materials used in production with recycled products – without compromising product quality. This also improves the environmental performance of the GRAF product range. Sustainability is also hugely important during the manufacturing process. For example, the waste heat from production is used to heat the production and logistics building.

From pioneer to market leader
GRAF has over 50 years of experience in the development and manufacturing of high-quality plastic products. The company launched its first rainwater barrels in 1974 with the slogan „Rainwater is free“ and soon started marketing other rainwater harvesting products too. GRAF’s innovative and user-friendly water management solutions have since made the company a leading system vendor in Europe.

Quality comes first
GRAF uses state-of-the-art production facilities. A high standard of quality in production is an essential starting point for unique products. End-to-end quality assurance and a high level of automation guarantee maximum reliability in production. Because of our high standard of quality, we offer a warranty of up to 15 years on GRAF products.

GRAF and KLARO – two strong wastewater technology brands
Just as the GRAF wastewater tank is a state-of-the-art product, for over 50 years the KLARO brand has been synonymous with reliable wastewater treatment technology. KLARO, the European market leader in SBR wastewater treatment systems with pneumatic lifting technology, has been a member of the GRAF group since 2014. Every GRAF wastewater product therefore benefits from the experience gained from over half a million satisfied wastewater customers and the quality of two established brands in decentralised wastewater treatment.

Plastic – clear advantages over concrete
Concrete tanks are at risk of corrosion through constant contact with wastewater and may require expensive refurbishment. Plastic tanks, on the other hand, have smooth inner surfaces that will not corrode. Also, because of their low weight, plastic tanks can be installed without heavy equipment. This means that they can be easily transported and installed in locations that are difficult to access.

Fast responses, even when special solutions are needed
GRAF products are exported around the globe. Intelligent logistics and sufficient stock levels ensure first-class availability of standard solutions, as well as for customised wastewater solutions.
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## SMALL BIOLOGICAL WASTEWATER TREATMENT SYSTEMS
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- one2clean/one2clean plus: One-tank system
  - 3 – 9 PE
- one2clean/one2clean plus: Two-tank system
  - 7 – 18 PE
- Klaro E Professional – Facts
- Klaro E Professional – Multitank system
  - 16 – 50 PE
- Klaro E Professional – Benefits
- Klaro E Professional for retrofitting
  - 5 – 50 PE
- Accessories

## LARGE BIOLOGICAL WASTEWATER TREATMENT SYSTEMS
- one2clean plus XXL
  - 24 – 70 PE
- Klaro L
  - 60 – 180 PE
- Klaro XL
  - 38 – 200 PE
- Klaro XXL
  - 75 – 1000 PE
- Klaro XXL Retrofitting
  - 100 – 1500 PE
- External Cabinets

## CONTAINER.BLUE

## POWERLESS WASTEWATER TREATMENT SYSTEMS
- Biomatic system
- Anaerobix – Wastewater Treatment System with Biological Filter
- Anaerobix XL/XXL
- Carat RS Septic tank
- Cesspools
- Herkules Septic Tank and Cesspool

## SEPARATORS
- Grease separator
- Light fluid separator

## CARAT UNDERGROUND TANK
- Carat RS underground tank – the GRAF modular system
- Carat RS underground tank – benefits
- Carat RS underground tank – tank sizes
- Carat RS underground tank – tank domes and covers
- Carat RS underground tank – baffle positions
- Carat RS underground tank – system packs
- Carat XL underground tank
- Carat XXL underground tank

## CONTAINER.BLUE

## POWERLESS WASTEWATER TREATMENT SYSTEMS

## SEPARATORS

## CARAT UNDERGROUND TANK

## SYMBOLS USED IN THIS CATALOGUE
- Load capacity
  - Suitable for pedestrian loading
  - Suitable for vehicle loading
  - Suitable for lorry loading

## WEBCODE G5101
- The webcode takes you straight to the information you need.
  - Installation instructions
  - Dimensional drawings
  - Accreditations
  - Declarations of conformity

## INFILTRATION
- Infiltration Tunnel

## WEBCODE G5101

## WEBCODE G5101

## WEBCODE G5101

## WEBCODE G5101
Small Biological Wastewater Treatment System

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

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## System Comparison

### System comparison

<table>
<thead>
<tr>
<th>Parameter</th>
<th>one2clean</th>
<th>one2clean plus</th>
<th>Klaro E Professional KL24base</th>
<th>Klaro E Professional KL24plus</th>
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<tr>
<td>COD (chemical oxygen demand)</td>
<td>94.7 %</td>
<td>99.7 %</td>
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<tr>
<td>BOD (biological oxygen demand)</td>
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<td>95.9 %</td>
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<tr>
<td>SS (suspended solids)</td>
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<td>96.9 %</td>
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<tr>
<td>NH₄-N</td>
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<td>88.7 %</td>
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<td>86.2 %</td>
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<td>N₅₅</td>
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<td>86.8 %</td>
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<td>69.9 %</td>
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<tr>
<td>P₅₅</td>
<td>–</td>
<td>95.1 %</td>
<td>–</td>
<td>94.5 %</td>
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<td>eColi</td>
<td>–</td>
<td>99.9 %</td>
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</table>

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

- **COD (chemical oxygen demand)**: 94.7% for one2clean, 99.7% for one2clean plus, 93.2% for Klaro E Professional KL24base, 99.3% for Klaro E Professional KL24plus.
- **BOD (biological oxygen demand)**: 98.0% for one2clean, 98.1% for one2clean plus, 95.9% for Klaro E Professional KL24base, 96.9% for Klaro E Professional KL24plus.
- **SS (suspended solids)**: 96.3% for one2clean, 95.7% for one2clean plus, 94.4% for Klaro E Professional KL24base, 96.9% for Klaro E Professional KL24plus.
- **NH₄-N**: 98.3% for one2clean, 88.7% for one2clean plus, 86.2% for Klaro E Professional KL24base, 86.2% for Klaro E Professional KL24plus.
- **N₅₅**: 87.0% for one2clean, 86.8% for one2clean plus, 57.1% for Klaro E Professional KL24base, 69.9% for Klaro E Professional KL24plus.
- **P₅₅**: Not available.
- **eColi**: Not available.
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.

### Why use the **one2clean** system?

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

**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.

**one2clean** is a clean solution

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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.

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

3. **Clear water extraction phase**
   The wastewater treatment is carried out in one chamber in just one tank. This eliminates unnecessary pumping processes and sludge return.

**one2clean** only needs 3 steps to produce clear water

- 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** 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.

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**Minimal power consumption**

- **9 W energy-saving light bulb**
  - ECO
  - 0.03 kWh
- **Fluidised bed systems**
  - 0.23 kWh
- **Packed bed systems**
  - 0.27 kWh
- **Aeration systems**
  - 0.05 kWh

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

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**Technical data**

**System**

<table>
<thead>
<tr>
<th>one2clean</th>
<th>one2clean plus</th>
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<tbody>
<tr>
<td>System conformity</td>
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<td>Purifying technology</td>
<td>fully biological SBR lifting technology</td>
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<td>One-tank systems available up to</td>
<td>9 inhabitants</td>
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<td>Two-tank systems available up to</td>
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**Parameter**

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<th>SS (suspended solids)</th>
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**Additional modules**

- K and D modules included
- **Hygiene modules**
  - Remote transmission modules
  - Carbon infeed module
  - Phosphate removal module
  - Pump-operated outlet module

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**One-tank system one2clean / one2clean plus**

<table>
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<tr>
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<td>2200</td>
<td>2390</td>
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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

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**Two-tank system one2clean / one2clean plus**

<table>
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<tr>
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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
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

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

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

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

Conventional wastewater treatment systems
- 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

Otto Graf GmbH

Components and Benefits

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

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

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

one2clean / one2clean plus control cabinets
- 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
- Incredible 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)

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.

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

Charge phase
The wastewater goes first into primary treatment (1st chamber), where the solid substances are retained. From there, wastewater is fed into the SBR tank (2nd chamber).

Clear water extraction phase
The purified wastewater is now fed into a discharge system (stream, river, sea) or into an infiltration system. Afterwards, the sludge is fed back from the SBR tank into the first chamber.

Settling phase
A settling phase now follows, during which the live sludge sinks to the bottom of the system. This allows a clarified water zone to form at the top of the SBR tank.

Aeration phase
The actual biological cleaning by microorganisms now takes place in the SBR tank. Short aeration and rest phases alternate in a controlled cleaning process. The so-called activated sludge can now develop with millions of microorganisms and clean the water thoroughly.

Minimal power consumption per inhabitant

(The diagram shows the annual power consumption of various treatment systems per inhabitant equivalent. Source: wet magazine, edition 6/2007 “Die Kleinkläranlage als Dauerlösung”, page 17, table 3, practical data; Klaro E Professional: Calculated running costs based on a 8 PE treatment plant.)
Klaro E Professional
Multitank system

Technical data

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<th>System Klaro E Professional</th>
<th>Klarbase</th>
<th>Klarplus</th>
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<tbody>
<tr>
<td>System conformity</td>
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<td>Purifying technology</td>
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<td>SBR lifting technology</td>
<td>SBR lifting technology</td>
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<td>Warranty for underground tank</td>
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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Klarbase</th>
<th>Klarplus</th>
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<tbody>
<tr>
<td>COD (chemical oxygen demand)</td>
<td>91.9 %</td>
<td>93.1 %</td>
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<tr>
<td>BOD (biochemical oxygen demand)</td>
<td>95.9 %</td>
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<td>SS (suspended solids)</td>
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<tr>
<td>NH₄-N</td>
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<td>eColi</td>
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Results of practical testing undertaken by the Prüfinstitut für Abwassertechnik (Testing Institute for Wastewater Technology), Aachen

Accessories
**page 24**

Klaro E Professional multitank system

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Scope of supply: Carat RS 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
- **D** Denitrification module
- **H** Hygiene modules
- **B** Module buffer pump for short-term peak loads
- **P** Phosphate removal module
- **R** Remote transmission modules

Ideal for infiltration of cleaned wastewater

**page 88**

Webcode G5103

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Klaro E Professional
The classic wastewater treatment technology

Components and Benefits

Covers
- Suitable for pedestrian or vehicle loading
- Adjustable in height
- Inclisable up to 5°
- Enables flash 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 t 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 tankdome 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
- Extremly 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 comfortibility at home (with KL24plus)
  - Automatic holiday mode
  - System adjust itself by changing life situation

Efficiency factor of up to 98%
Klaro E Professional for retrofitting

5 – 50 PE (750 – 7,500 l/day)

Want to bring your multi-chamber pit bang up to date? Then get in touch!

The GRAF system packs allow existing tanks to be used with the proven GRAF Klaro E Professional.

Retrofitting – what needs to be done?

- Empty and clean pit
- Test tank to ensure leak-tightness / seal the baffle
- Measure existing pit: baffle height, diameter / depth dimensions
- Contact GRAF

Our experienced team takes all local circumstances into account to dimension your required system-pack.
**Accessories**

**+K Convenience module**

Convenience module: control with larger display and keypad. Underload detection by a pressure sensor in the control.

Control unit KL24plus

- SD card slot for easy logbook transfer
- Automatic underload detection
- Suitable for phosphate precipitation and UV module
- Large display and 14 keys for comfortable operation
- Automatic logging
- Battery-free power failure detection
- High-contrast display with blue backlighting
- Durable, gas-tight membrane keypad

On request

**+B Module buffer pump for short-term peak loads**

Only suitable for Klaro E Professional

- Buffer tank and pump
- Klaro E Professional

On request

**+D Denitrification module**

The +D module for denitrification (removal of nitrogen) results in the clarified water quality satisfying very strict requirements. The GRAF systems thereby attain a $N_{\text{total}}$ value (total parameters of inorganic nitrogen compounds) of less than 25 mg/l.

Order no. 107520

**+O Pump-operated outlet module**

Lift the clear water when the outlet pipe is lower than the water course.

On request

**+C Carbon infeed module**

Solution for weekend homes

The addition of carbon as a nutrient allows the purification process to continue and prevents the biology from dying off.

On request

**+P Phosphate removal module**

Phosphate in water results in a massive build-up of algae. The GRAF +P module ensures the safe removal of phosphate and therefore great water quality.

On request

**+R Remote transmission modules**

Remote monitoring allows error messages to be transmitted to mobile phones and operating data to be queried by text message. Convenient remote wastewater treatment system controlled by GSM (CSD, GPRS as option) or LAN is also possible.

- 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

On request

**+H Hygiene module – Disinfection**

Disinfection using the +H module (by chlor or UV) satisfies even the most stringent of purity requirements for a GRAF wastewater treatment system. It reliably kills off germs and microorganisms. The clarified water therefore complies with the EU Bathing Water Directive.

On request

- Easy to operate
- Maintenance-friendly thanks to easy-to-remove module
- Fitted in downstream shaft

**+H Hygiene module – Sand filtration**

In case of strict effluent quality requirements or high influent load variations, the GRAF sand filtration module is recommended to enhance and stabilize the purification performance of your sewage treatment system. The self-cleaning dual media filtration system reduces suspended solids, COD and BOD of the secondary clarified effluent and may also serve to prevent debris in downstream installed storage or collection tanks for the re-use of wastewater.

On request

- Patented, simple and valve-free setup with automatic gravitationally driven backwash for minimal maintenance requirements
- Certified performance according to EN 12566-7
- Prefabricated plug and play system guarantees minimal work for piping and installation onsite
- Robust UV- and waterproof housing with lock for outside installation

**+P Phosphate removal module**

The GRAF +P module ensures the safe removal of phosphate and therefore great water quality.
Accessories: Re-use of wastewater bluecycle (Chlorination & Sand Filter)

Wastewater re-use
Avoid the wastage of precious fresh water resources through the re-use of highly treated wastewater for outdoor purposes like gardening. We recommend you combine the advantages of GRAF sand filtration and GRAF chlorination subsequent to your GRAF biological sewage treatment plant for the safe re-use and storage of your treated wastewater.

- Reduction of suspended solids, COD and BOD followed by chemical disinfection
- Prevention of pathogen regrowth and fouling in water hoses and irrigation systems through the long-term effect of chlorine
- Filtration upstream of the disinfection stage reduces the chlorine demand effectively and prevents debris in the chlorine contact basin
- Certified performance according to EN 12566-7

External plastic cabinet M
With auxiliary control and dosing pump for Chlorine module

Sand filter

Chlor module reaction tank

Chlorination with well available liquid sodium hypochlorite solution
- Safe and simple handling of the disinfection chemical
- Easy adjustment of the chlorine dosage pump to meet site-specific requirements
- Volume-proportional disinfectant dosing for low and stable chemical consumption
- Process kills near all the ecoli

Re-use for:
- Harvesting lawn and flowers
- Harvesting fruit and vegetable garden
- Clean your car
- General cleaning

Bluecycle components:
1. Oxylift clearwater pump
2. Dosing pump with auxiliary control for Chlorine
3. Sand filter
4. 5 m Clearwater hose 1 1/4"
5. Tray for Chlorine canister
6. Reaction tank for tertiary treatment

Performance Results bluecycle

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>eColi</td>
<td>99.9 %</td>
</tr>
<tr>
<td>Total coliforms</td>
<td>99.9 %</td>
</tr>
</tbody>
</table>

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

bluecycle – re-use your treated water
Up to 15 PE
Order no. 106390

Up to 20 PE
Order no. 106574
External Plastic Cabinet S
For one2clean

The image shows the External plastic cabinet S for 3 – 18 inhabitants

Benefits
✓ Flexible application of the proven one2clean control cabinet in a plastic external column
✓ Weather-resistant plastic
✓ Edge seal for complete sealing over the ground
✓ High corrosion protection for the electrical parts
✓ Good value for money
✓ Easy assembly
✓ No foundation necessary

External plastic cabinet S
For 3 – 18 inhabitants (up to 2,700 l/d)
Order no. 107990

Technical data
For air compressors XP 60/80, HP 100 – 200
Upstream fuse B16A (provided by customer)
Voltage supply 230 V AC ± 20 %, 50 Hz
IP IP44
Relative air humidity 10 to 95 %
Temperature range -25°C to +50°C
Total weight 7 kg (15.4 lbs)
Connecting line via two-pin earthed plug

Compatibility
one2clean 3 – 18 PE

Accessories for small wastewater treatment systems

Odour-tight empty pipe seal DN 100 for systems compatible with SBR-hose packages up to 28 PE
✓ Ensures no air, humidity or gas escapes from conduit pipe
✓ No need for PU seals
✓ Clean and professional solution
Order no. 107887

SBR hose package
For one2clean / one2clean plus (one-tank systems)
Includes: 1 x Ø 13 mm and 1 x Ø 13 mm
PVC hose; colour-coded
Length: 10 m
Order no. 107886
Length: 20 m
Order no. 107888
Other SBR-hoses on request

Graf Handbook of Wastewater Treatment
More information about wastewater can be found in our Handbook of Wastewater Treatment.

External Plastic Cabinet M
For one2clean/one2clean plus

The image shows the External plastic cabinet M for 3 – 18 inhabitants with LED warning light

Benefits
✓ Easy access for the maintenance fitter
✓ Function checking is simple as the control unit is located immediately next to the system
✓ Ideal solution for large distances from the house (> 20 m)
✓ Flexible use of the proven GRAF EPP control cabinet in the External plastic cabinet L (size 3 – 18 inhabitants)
✓ Lockable housing in sturdy, weather-resistant plastic
✓ Integrated double power socket for easy maintenance
✓ No foundation necessary

External plastic cabinet M
For 3 – 18 inhabitants (up to 2,700 l/d)
Order no. 107773

Technical data
For air compressors LA 45 – 80, XP 60/80, HP 100 – 200
Upstream fuse B16A (provided by customer)
Voltage supply 230 V AC ± 20 %, 50 Hz
IP IP44
Relative air humidity 10 to 95 %
Temperature range -25°C to +50°C
Total weight 10 kg (22 lbs)
Connecting line via two-pin earthed plug

Compatibility
one2clean 3 – 18 PE
one2clean plus 3 – 18 PE

Sampling point, internal
For two- and multitank systems ≤ 60 PE
Order no. 107170
External Plastic Cabinet L
For Klaro E Professional

**Benefits**
- Easy access for the maintenance fitter
- Function checking is simple as the control unit is located immediately next to the system
- Lockable housing (simultaneous locking) in sturdy, weather-resistant plastic
- Hose connections colour-coded
- No foundation necessary

**External Plastic Cabinet L**
For 16 – 44 inhabitants (up to 6,600 l/d)
On request

**Technical data**

<table>
<thead>
<tr>
<th>For air compressors</th>
<th>LA 120, 200, DT 4.10, 4.16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream fuse</td>
<td>BS6A (provided by customer)</td>
</tr>
<tr>
<td>Voltage supply</td>
<td>230 V AC ± 10 %, 50 Hz</td>
</tr>
<tr>
<td>IP</td>
<td>IP 44</td>
</tr>
<tr>
<td>Relative air humidity</td>
<td>10 to 95 %</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-25°C to +50°C</td>
</tr>
<tr>
<td>Total weight</td>
<td>22 kg</td>
</tr>
<tr>
<td>Connecting line</td>
<td>via two-pin earthed plug</td>
</tr>
<tr>
<td>Air compressor</td>
<td>230 V</td>
</tr>
<tr>
<td>Stepped motors</td>
<td>24 V</td>
</tr>
</tbody>
</table>

**Compatibility**
Klaro E Professional 16 – 44 PE

**Sampling point, internal**
For two- and multitank systems ≤ 60 PE
Order no. 107170

**Filling granulat for External Plastic Cabinet L**
Prevents soil moisture from rising into the cabinet. 1 bag required; 50 l bag
Order no. 107607

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**External Steel Cabinet XL**
For Klaro E Professional

**Benefits**
- Particularly robust design of powder coated steel sheet (1.5 mm / 0.005")
- Spray proof (IP 44)
- Lockable housing
- Hose connections colour-coded

**External Steel Cabinet XL**
For 42 – 50 inhabitants (up to 7,500 l/d)
On request
Solid foundation must be provided on-site.

**Technical data**

<table>
<thead>
<tr>
<th>For compressors</th>
<th>DT 4.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>External surfaces</td>
<td>Steel sheet 1.5 mm (0.005&quot;), powder coated</td>
</tr>
<tr>
<td>Lock</td>
<td>Espagnolette lock (simultaneous locking), pivoted lever lock incl. profile half cylinder</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>1140 x 1080 x 720 mm</td>
</tr>
<tr>
<td>Empty weight</td>
<td>140 kg</td>
</tr>
</tbody>
</table>

**Compatibility**
Klaro E Professional 42 – 50 PE

---

**External Steel Cabinet XL**
For Klaro E Professional

**SBR hose package**
For Klaro E Professional systems up to 28 PE
Includes: 1 x Ø 19 mm and 3 x Ø 13 mm PVC hose;
colour-coded
Length: 10 m
Order no. 107190
Length: 20 m
Order no. 107192
Other SBR-hoses on request

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**Otto Graf GmbH**

**ottograf.com**

**GRAF Handbook of Wastewater Treatment**
More information about wastewater can be found in our Handbook of Wastewater Treatment.

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**Otto Graf GmbH**
Large Biological Wastewater Treatment Systems

- one2clean plus XXL
- Klaro L
- Klaro XL
- Klaro XXL
- Klaro XXL Retrofitting
- External Cabinets

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## System Comparison

### System comparison

<table>
<thead>
<tr>
<th>System</th>
<th>one2clean plus XXL</th>
<th>Klaro L</th>
<th>XL</th>
<th>XXL</th>
<th>XXL Retrofitting</th>
</tr>
</thead>
<tbody>
<tr>
<td>System conformity</td>
<td>EN 12566-3 / ATV A-122</td>
<td>ATV A-122</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purifying technology</td>
<td>fully biological</td>
<td>fully biological</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systems available up to</td>
<td>20 inhabitants / 10,500 l/d</td>
<td>1500 inhabitants / 235,000 l/d</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance interval</td>
<td>2 – 4 per year</td>
<td>2 – 4 per year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty for underground tank</td>
<td>15 years</td>
<td>15 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty for purifying technology</td>
<td>3 years</td>
<td>3 years</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Control

- **+D** Removal of nitrogen
- **+P** Phosphate removal
- **+C** Carbon injection
- **+H** Disinfection
- **+R** Remote transmission controlled by GSM (CSD, GPRS as option) or LAN
- Control power failure recognition
- Temperature sensor to protect against overheating
- Logbook function
- Operation: 14 keys
- Serial interface for software updates
- External control cabinet for installing control unit outdoors

*Standard equipment: ● Available as options: ○
**Technical data**

<table>
<thead>
<tr>
<th>System</th>
<th>one2clean plus XXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>System conformity</td>
<td>EN 12566-3 ≤ 50 PE / ATV A-122 &gt; 50 PE</td>
</tr>
<tr>
<td>Purifying technology</td>
<td>fully biological SBR lifting technology</td>
</tr>
<tr>
<td>One-tank systems available up to</td>
<td>70 inhabitants</td>
</tr>
<tr>
<td>Maintenance interval</td>
<td>1 – 2 per year</td>
</tr>
<tr>
<td>Warranty for underground tank</td>
<td>15 years</td>
</tr>
<tr>
<td>Warranty for purifying technology</td>
<td>3 years</td>
</tr>
</tbody>
</table>

### Scope of supply:
- Carat XXL underground tank, tank domes maxi, telescopic dome shafts, factory pre-fitted technology and control cabinet for internal fitting. Air hoses are not included and must be ordered separately.

### Total measurements:
- **24 – 30 PE (3,600 – 10,500 l/day)**
- **24 – 70 PE (3,600 – 10,500 l/day)**

### Additional modules:
- +K and +D modules included

### Webcodes:
- **G5115**

### Sampling point, internal
For multtank systems ≤ 60 PE
Order no. 107170

### Covers
Suitable for pedestrian or car loading

### Filling granulat for External plastic cabinet L
Prevents soil moisture from rising into the External plastic cabinet. 1 bag required for 24 – 32 inhabitants; 50l bag
Order no. 107607

### External steel cabinet XL
For 45 – 70 PE
Order no. 106064

### External plastic cabinet L
For 24 – 32 PE
Order no. 106261

### Ideal for infiltration of cleaned wastewater

---

**one2clean plus XXL system – fully prefitted in the Carat XXL underground tank**

<table>
<thead>
<tr>
<th>Inhabitants (max.)</th>
<th>Volume (litres)</th>
<th>Max. daily flow (l/d)</th>
<th>Max. organic load [kg BOD5/d]</th>
<th>Required air hoses [quantity x Ø mm]</th>
<th>Length* [m]</th>
<th>Width* [m]</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>16,000</td>
<td>3,600</td>
<td>1.44</td>
<td>2 x 19</td>
<td>4.66</td>
<td>2.50</td>
<td>106261</td>
</tr>
<tr>
<td>32</td>
<td>22,000</td>
<td>4,800</td>
<td>1.92</td>
<td>2 x 19</td>
<td>6.15</td>
<td>2.50</td>
<td>106262</td>
</tr>
<tr>
<td>45</td>
<td>32,000</td>
<td>6,750</td>
<td>2.7</td>
<td>2 x 19</td>
<td>8.53</td>
<td>2.50</td>
<td>106264</td>
</tr>
<tr>
<td>50</td>
<td>38,000</td>
<td>7,500</td>
<td>3.0</td>
<td>2 x 19</td>
<td>10.01</td>
<td>2.50</td>
<td>106265</td>
</tr>
<tr>
<td>60</td>
<td>44,000</td>
<td>9,000</td>
<td>3.6</td>
<td>4 x 19</td>
<td>11.50</td>
<td>2.50</td>
<td>106064</td>
</tr>
<tr>
<td>70</td>
<td>48,000</td>
<td>10,500</td>
<td>4.2</td>
<td>5 x 25</td>
<td>12.40</td>
<td>2.50</td>
<td>106369</td>
</tr>
</tbody>
</table>

Scope of supply: Carat XXL underground tank, tank domes maxi, telescopic dome shafts, factory pre-fitted technology and control cabinet for internal fitting. Air hoses are not included and must be ordered separately.

---

**Sampling point, external Universal shaft 600**
For multtank system ≤ 60 PE
Order no. 330136

---

**Covers**
Suitable for pedestrian or car loading

---

**Ideal for infiltration of cleaned wastewater**
Klaro L
60 – 180 PE (9,000 – 27,000 l/day)

Technical data

<table>
<thead>
<tr>
<th>System</th>
<th>Klaro L</th>
</tr>
</thead>
<tbody>
<tr>
<td>System conformity</td>
<td>ATV A-122</td>
</tr>
<tr>
<td>Purifying technology</td>
<td>fully biological</td>
</tr>
<tr>
<td>SBR lifting technology</td>
<td></td>
</tr>
<tr>
<td>Multi-tank systems available up to</td>
<td>180 inhabitants</td>
</tr>
<tr>
<td>Maintenance interval</td>
<td>3 – 4 per year</td>
</tr>
<tr>
<td>Warranty for underground tank</td>
<td>15 years</td>
</tr>
<tr>
<td>Warranty for purifying technology</td>
<td>3 years</td>
</tr>
</tbody>
</table>

Klaro L system for the Carat RS underground tank

<table>
<thead>
<tr>
<th>Inhab. (max.)</th>
<th>Max. daily flow (l/d)</th>
<th>Max. organic load [kg BOD5/d]</th>
<th>Total number of tanks</th>
<th>Primary treatment [capacity in l]</th>
<th>SBR tank [capacity in l]</th>
<th>Required air hoses [quantity x Ø mm]</th>
<th>Length* [m]</th>
<th>Width* [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>9,000</td>
<td>3.60</td>
<td>4</td>
<td>2 x 6,500</td>
<td>2 x 6,500</td>
<td>6 x 19</td>
<td>11.10</td>
<td>2.20</td>
</tr>
<tr>
<td>90</td>
<td>13,500</td>
<td>5.40</td>
<td>5</td>
<td>2 x 6,500</td>
<td>3 x 6,500</td>
<td>9 x 19</td>
<td>11.10</td>
<td>4.00</td>
</tr>
<tr>
<td>120</td>
<td>18,000</td>
<td>7.20</td>
<td>7</td>
<td>3 x 6,500</td>
<td>4 x 6,500</td>
<td>12 x 19</td>
<td>11.10</td>
<td>4.90</td>
</tr>
<tr>
<td>150</td>
<td>22,500</td>
<td>9.00</td>
<td>9</td>
<td>4 x 6,500</td>
<td>5 x 6,500</td>
<td>14 x 19</td>
<td>14.00</td>
<td>4.90</td>
</tr>
<tr>
<td>180</td>
<td>27,000</td>
<td>10.80</td>
<td>10</td>
<td>4 x 6,500</td>
<td>6 x 6,500</td>
<td>16 x 19</td>
<td>11.10</td>
<td>7.60</td>
</tr>
</tbody>
</table>

Scope of supply: Carat RS underground tanks tank domes maxi, telescopic dome shafts, system pack Klaro L and control cabinet for internal fitting. The air hoses from the underground tanks to the control panel are not included.

*Total measurements (>> page 74 – the GRAF modular system)

Ideal for infiltration of cleaned wastewater

Sampling point, external Universal shaft 600
For multitank system ≥ 60 PE
Order no. 310136

Extension 300 mm
For universal shaft 600
Order no. 371003

Covers
Suitable for pedestrian or car loading
>> page 80

Compact dosing pump
0 – 37 ml/min
Order no. 107348

External steel cabinet XL
For 60 – 150 inhabitants
>> page 46

External steel cabinet XXL
For 160 – 200 inhabitants

Additional modules
+K module included

+D Denitrification module
+H Hygiene modules
+P Phosphate removal module
+R Carbon infeed module

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## Klaro XL

38 – 200 PE (5,700 – 30,000 l/day)

---

### Technical data

<table>
<thead>
<tr>
<th>System</th>
<th>Klaro XL</th>
</tr>
</thead>
<tbody>
<tr>
<td>System conformity</td>
<td>ATV A 122 ≥ 50 PE</td>
</tr>
<tr>
<td>Purifying technology</td>
<td>Fully biological SBR lifting technology</td>
</tr>
<tr>
<td>Multi-tank systems available up to</td>
<td>200 inhabitants</td>
</tr>
<tr>
<td>Maintenance interval</td>
<td>2 – 4 per year</td>
</tr>
<tr>
<td>Warranty for underground tank</td>
<td>15 years</td>
</tr>
<tr>
<td>Warranty for purifying technology</td>
<td>3 years</td>
</tr>
</tbody>
</table>

---

### Klaro XL system – fully prefitted in the Carat XL underground tank

**Scope of supply:** Carat XL underground tanks, tank dome maxi, telescopic dome shafts, factory pre-fitted technology and control cabinet for internal fitting. The air hoses from the underground tanks to the control panel are not included.

**Additional modules**

- +K module included
- Covers: Suitable for pedestrian or car loading
- Denitrification module
- Hygiene modules
- Phosphate removal module
- Carbon infed module
- Remote transmission modules

---

### Table: Technical data

<table>
<thead>
<tr>
<th>Inhab. (max.)</th>
<th>Max. daily flow (l/d)</th>
<th>Max. organic load (kg BOD5/l)</th>
<th>Total number of tanks</th>
<th>Primary treatment [capacity in l]</th>
<th>SBR tank [capacity in l]</th>
<th>Required air hoses [quantity x Ø mm]</th>
<th>Length [m]</th>
<th>Width [m]</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>38**</td>
<td>5,700</td>
<td>2.28</td>
<td>2</td>
<td>1 x 8,500</td>
<td>1 x 8,500</td>
<td>3 x 19</td>
<td>7.50</td>
<td>2.04</td>
<td>107755</td>
</tr>
<tr>
<td>46**</td>
<td>6,900</td>
<td>2.76</td>
<td>2</td>
<td>1 x 10,000</td>
<td>1 x 10,000</td>
<td>3 x 19</td>
<td>7.54</td>
<td>2.24</td>
<td>107756</td>
</tr>
<tr>
<td>80</td>
<td>12,000</td>
<td>4.80</td>
<td>4</td>
<td>2 x 8,500</td>
<td>2 x 8,500</td>
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<tr>
<td>145</td>
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<td>8.70</td>
<td>7</td>
<td>3 x 8,500</td>
<td>4 x 8,500</td>
<td>12 x 19</td>
<td>7.54</td>
<td>10.46</td>
<td>106176</td>
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<tr>
<td>165</td>
<td>26,750</td>
<td>9.90</td>
<td>7</td>
<td>3 x 10,000</td>
<td>4 x 10,000</td>
<td>12 x 19</td>
<td>7.54</td>
<td>10.46</td>
<td>106177</td>
</tr>
</tbody>
</table>

*Total measurements **Only removal of carbon

---

### Sampling points

- **Sampling point, internal**
  - For multitank systems ≤ 60 PE
  - Order no. 107170

- **Sampling point, external**
  - Universal shaft 600
  - For multitank system ≤ 60 PE
  - Order no. 330136

- **Sampling point, external**
  - Universal shaft 1000
  - For multitank system ≥ 60 PE
  - Order no. 371003

---

### Sampling point, external

<table>
<thead>
<tr>
<th>External plastic cabinet L</th>
<th>For 38 – 46 inhabitants</th>
<th>page 46</th>
</tr>
</thead>
<tbody>
<tr>
<td>External steel cabinet XL</td>
<td>For 80 – 145 inhabitants</td>
<td>page 46</td>
</tr>
<tr>
<td>External steel cabinet XXL</td>
<td>For 180 – 200 inhabitants</td>
<td>page 47</td>
</tr>
</tbody>
</table>

---

### Covers

- Suitable for pedestrian or car loading
- Order no. 371003

---

### Additional modules

- +K module included
- Covers: Suitable for pedestrian or car loading
- Denitrification module
- Hygiene modules
- Phosphate removal module
- Carbon infed module
- Remote transmission modules

---

### System conformity

- ATV A 122 ≥ 50 PE
- Fully biological SBR lifting technology
- Multi-tank systems available up to 200 inhabitants | 30,000 l/d
- Maintenance interval 2 – 4 per year
- Warranty for underground tank 15 years
- Warranty for purifying technology 3 years

---

### Sampling point, internal

- For multitank systems ≤ 60 PE
- Order no. 107170

---

### Sampling points

- Sampling point, external
  - Universal shaft 600
  - For multitank system ≤ 60 PE
  - Order no. 330136

---

### Sampling point, external

- Extension 300 mm
  - For universal shaft 600
  - Order no. 371003

---

### Klaro XL

- Suitable for infiltration of cleaned wastewater
- Ideal for infiltration of cleaned wastewater
- Order no. 371003

---

### Sampling point, external

- External steel cabinet XL
  - For 80 – 145 inhabitants
  - Order no. 107176

---

### Sampling point, external

- External steel cabinet XXL
  - For 180 – 200 inhabitants
  - Order no. 106177
**Klaro XXL**

75 – 1000 PE (11,250 – 150,000 l/day)

---

### Technical data

<table>
<thead>
<tr>
<th>System</th>
<th>Klaro XXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>System conformity</td>
<td>ATV A 122 &gt; 50 PE</td>
</tr>
<tr>
<td>Purifying technology</td>
<td>fully biological SBR lifting technology</td>
</tr>
<tr>
<td>Multi-tank systems available up to</td>
<td>1000 inhabitants</td>
</tr>
<tr>
<td>Maintenance interval</td>
<td>3 – 4 per year</td>
</tr>
<tr>
<td>Warranty for underground tank</td>
<td>15 years</td>
</tr>
<tr>
<td>Warranty for purifying technology</td>
<td>3 years</td>
</tr>
</tbody>
</table>

---

### Accessory

#### Sampling point, external

Universal shaft 600
For multitank system ≥ 60 PE
Order no. 301316

---

### Covers

Suitable for pedestrian or car loading

---

### Compact dosing pump

0 – 37 ml/min
Order no. 107348

---

### Additional modules

- **+K** module included
  - D: Denitrification module
  - P: Phosphate removal module
  - C: Carbon infeed module
  - R: Remote transmission module

---

### External steel cabinet XL

For 75 – 150 inhabitants
Order no. 330136

---

### External steel cabinet XXL

For 200 – 1000 inhabitants
Order no. 371003

---

### Scope of supply: Klaro XXL underground tank, tank domes maxi, telescopic dome shafts, factory pre-fitted technology and control cabinet for internal fitting. The air hoses from the underground tanks to the control panel are not included. *Total measurements

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>11,250</td>
<td>4.50</td>
<td>1x10,000</td>
<td>1x10,000</td>
<td>3x19, 1x25</td>
<td>9.90</td>
<td>2.50</td>
<td>106125</td>
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<td>100</td>
<td>15,000</td>
<td>6.00</td>
<td>1x12,000</td>
<td>1x12,000</td>
<td>5x19, 1x25</td>
<td>12.90</td>
<td>2.50</td>
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<tr>
<td>150</td>
<td>22,500</td>
<td>9.00</td>
<td>1x12,000</td>
<td>1x12,000</td>
<td>6x25</td>
<td>17.70</td>
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<td>2x12,000</td>
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<td>10x25</td>
<td>26.40</td>
<td>2.50</td>
<td>106670</td>
</tr>
<tr>
<td>250</td>
<td>37,500</td>
<td>15.00</td>
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<td>2x12,000</td>
<td>12x25</td>
<td>33.30</td>
<td>2.50</td>
<td>106670</td>
</tr>
<tr>
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<td>45,000</td>
<td>18.00</td>
<td>2x12,000</td>
<td>2x12,000</td>
<td>12x25</td>
<td>40.20</td>
<td>2.50</td>
<td>106670</td>
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<td>350</td>
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<td>21.00</td>
<td>3x12,000</td>
<td>3x12,000</td>
<td>12x25</td>
<td>47.10</td>
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<td>106670</td>
</tr>
<tr>
<td>400</td>
<td>60,000</td>
<td>24.00</td>
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<td>3x12,000</td>
<td>12x25</td>
<td>53.90</td>
<td>2.50</td>
<td>106670</td>
</tr>
<tr>
<td>450 / 500</td>
<td>75,000</td>
<td>30.00</td>
<td>3x12,000</td>
<td>4x12,000</td>
<td>12x25</td>
<td>60.70</td>
<td>2.50</td>
<td>106670</td>
</tr>
<tr>
<td>550 / 600</td>
<td>90,000</td>
<td>36.00</td>
<td>3x26,000</td>
<td>4x32,000</td>
<td>24x25</td>
<td>16.30</td>
<td>11.80</td>
<td>106189</td>
</tr>
<tr>
<td>650 / 700</td>
<td>105,000</td>
<td>42.00</td>
<td>4x42,000</td>
<td>4x42,000</td>
<td>24x25</td>
<td>25.00</td>
<td>11.80</td>
<td>106189</td>
</tr>
<tr>
<td>750 / 800</td>
<td>120,000</td>
<td>48.00</td>
<td>4x32,000</td>
<td>4x32,000</td>
<td>30x25</td>
<td>25.00</td>
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<td>106189</td>
</tr>
<tr>
<td>850 / 900</td>
<td>135,000</td>
<td>54.00</td>
<td>3x26,000</td>
<td>4x32,000</td>
<td>36x25</td>
<td>29.10</td>
<td>8.70</td>
<td>106189</td>
</tr>
<tr>
<td>950 / 1000</td>
<td>150,000</td>
<td>60.00</td>
<td>3x34,000</td>
<td>4x32,000</td>
<td>36x25</td>
<td>30.50</td>
<td>8.70</td>
<td>106189</td>
</tr>
</tbody>
</table>

*Total measurements

---

![Image of Klaro XXL system](image-url)

> Ideal for infiltration of cleaned wastewater

---

**Otto Graf GmbH**

303136

---

Large Biological Wastewater Treatment Systems
Klaro XXL Retrofitting for Onsite Concrete Tanks
100 – 1500 PE (15,000 – 225,000 l/day)

Checklist
To plan your system, we need the following information:

- What type of project?
  (Domestic, hotel, commercial etc.)
- How many people will use the system and what is the water consumption per head?
- What legal requirements apply to wastewater at the location?
- Local power grid

Special requirements
Systems for more than 50 inhabitants 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 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.

Klaro XXL Retrofitting for onsite concrete tanks

<table>
<thead>
<tr>
<th>Inhabitants [max.]</th>
<th>Max. daily flow [m³/d]</th>
<th>Max. organic load [kg BOD5/d]</th>
<th>Water depth [mm]</th>
<th>Sludge / buffer [m]</th>
<th>SBR chamber [m]</th>
<th>Compressor</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>15</td>
<td>6.00</td>
<td>3500</td>
<td>2.80 x 2.90</td>
<td>2.80 x 2.90</td>
<td>DTN 41</td>
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<tr>
<td>200</td>
<td>30</td>
<td>12.00</td>
<td>2750</td>
<td>2.80 x 5.40</td>
<td>2.80 x 5.40</td>
<td>KDT 3.80</td>
</tr>
<tr>
<td>300</td>
<td>45</td>
<td>18.00</td>
<td>3000</td>
<td>2.80 x 7.50</td>
<td>2.80 x 7.50</td>
<td>KDT 3.100</td>
</tr>
<tr>
<td>400</td>
<td>60</td>
<td>24.00</td>
<td>3000</td>
<td>5.50 x 4.90</td>
<td>5.50 x 4.90</td>
<td>KDT 3.140</td>
</tr>
<tr>
<td>500</td>
<td>75</td>
<td>30.00</td>
<td>3000</td>
<td>5.50 x 6.40</td>
<td>5.50 x 6.40</td>
<td>KDT 3.140</td>
</tr>
<tr>
<td>600</td>
<td>90</td>
<td>36.00</td>
<td>3000</td>
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<td>2 x 2.80 x 7.50</td>
<td>2 x KDT 3.100</td>
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<tr>
<td>700</td>
<td>105</td>
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<td>3000</td>
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<td>2 x KDT 3.140</td>
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<tr>
<td>800</td>
<td>120</td>
<td>48.00</td>
<td>3000</td>
<td>11.20 x 4.50</td>
<td>2 x 5.50 x 4.90</td>
<td>2 x KDT 3.140</td>
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<tr>
<td>900</td>
<td>135</td>
<td>54.00</td>
<td>3000</td>
<td>11.20 x 5.00</td>
<td>2 x 5.50 x 5.50</td>
<td>2 x KDT 3.140</td>
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<td>1000</td>
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<td>3000</td>
<td>11.20 x 5.60</td>
<td>2 x 5.50 x 6.40</td>
<td>2 x KDT 3.140</td>
</tr>
</tbody>
</table>

Further sizes up to 1500 PE on request

External cabinets and further accessories » page 46

Our experienced team will help you to plan your project. We take all local circumstances into account from the concept planning phase to implementation.

Machine technique
As an alternative to a conventional control cabinet, the technical components can be installed in a dedicated room or machine house. This guarantees sufficient space for all the necessary components and maximum flexibility.

Additional chamber for further treatment e.g. with UV (+H)

Machine technique

Example: Installation in a machine house

Example: Installation in an existing plant room
External Cabinets
For one2clean plus XXL, Klaro L | XL | XXL

External plastic cabinet L
- Easy access for the maintenance fitter
- Function checking is simple as the control unit is located immediately next to the system
- Lockable housing (simultaneous locking)
- Hose connections colour-coded
- No foundation necessary

External steel cabinet XL
- Particularly robust design of powder coated steel sheet (1.5 mm / 0.005”)
- Spray proof (IP 44)
- Lockable housing
- Hose connections colour-coded

External steel cabinet XXL
- Particularly robust design of powder coated steel sheet (1.5 mm / 0.005”)
- Spray proof (IP 44)
- Lockable housing
- Hose connections colour-coded

Technical data

<table>
<thead>
<tr>
<th>Component</th>
<th>L</th>
<th>XL</th>
<th>XXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filling granulate for Plastic cabinet L</td>
<td>Prevents soil moisture from rising into the cabinet; 1 bag required 50 litre bag</td>
<td>Order no. 107607</td>
<td></td>
</tr>
<tr>
<td>Upstream fuse</td>
<td>BsA (provided by customer)</td>
<td>BsA (provided by customer)</td>
<td>BsA (provided by customer)</td>
</tr>
<tr>
<td>Voltage supply</td>
<td>230 V AC ± 5%</td>
<td>380 VAC, ±5 %</td>
<td>380 VAC, ±5 %</td>
</tr>
<tr>
<td>IP</td>
<td>IP44</td>
<td>IP44</td>
<td>IP44</td>
</tr>
<tr>
<td>Relative air humidity</td>
<td>10 to 95 %</td>
<td>10 to 95 %</td>
<td>10 to 95 %</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-25°C to +50°C</td>
<td>-25°C to +50°C</td>
<td>-25°C to +50°C</td>
</tr>
<tr>
<td>Total weight</td>
<td>22 kg</td>
<td>140 kg</td>
<td>210 kg</td>
</tr>
<tr>
<td>Forming line</td>
<td>via two-pin earthed plug</td>
<td>via four-pin earthed plug</td>
<td>via four-pin earthed plug</td>
</tr>
<tr>
<td>Air compressor</td>
<td>750 l/min</td>
<td>380 l/min</td>
<td>380 l/min</td>
</tr>
<tr>
<td>Stepped motors</td>
<td>24 V</td>
<td>24 V</td>
<td>24 V</td>
</tr>
<tr>
<td>External surfaces</td>
<td>Plastic</td>
<td>Steel sheet 1.5 mm, powder coated</td>
<td>Steel sheet 1.5 mm, powder coated</td>
</tr>
<tr>
<td>Lock</td>
<td>Espagnolette lock (simultaneous locking), pivoted lever, lock incl profile half cylinder</td>
<td>Espagnolette lock (simultaneous locking), pivoted lever lock incl profile half cylinder</td>
<td>Espagnolette lock (simultaneous locking), pivoted lever lock incl profile half cylinder</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>480 x 1,750 x 340 mm</td>
<td>1,140 x 1,080 x 720 mm</td>
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Compatibility

<table>
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<th>L</th>
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<th>XXL</th>
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<tr>
<td>one2clean plus XXL</td>
<td>24 – 32 PE</td>
<td>45 – 70 PE</td>
<td>–</td>
</tr>
<tr>
<td>Klaro L</td>
<td>–</td>
<td>60 – 150 PE</td>
<td>180 PE</td>
</tr>
<tr>
<td>Klaro XL</td>
<td>–</td>
<td>80 – 145 PE</td>
<td>165 – 200 PE</td>
</tr>
<tr>
<td>Klaro XXL</td>
<td>–</td>
<td>75 – 150 PE</td>
<td>200 – 1,000 PE</td>
</tr>
<tr>
<td>Klaro XXL retrofitting</td>
<td>–</td>
<td>on request</td>
<td>on request</td>
</tr>
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</table>

Accessories

<table>
<thead>
<tr>
<th>Component</th>
<th>L</th>
<th>XL</th>
<th>XXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning light LED warning light for mounting on External plastic cabinet L. Including assembly material</td>
<td>Order no. 107861</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warning light LED warning light for mounting on External steel cabinet XL / XXL. Including assembly material</td>
<td>Order no. 107961</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBR hose Ø 19 mm, 20 m roll</td>
<td>transparent</td>
<td>Order no. 934692</td>
<td>red Order no. 934693</td>
</tr>
<tr>
<td>SBR hose Ø 25 mm</td>
<td>transparent</td>
<td>Order no. 934020</td>
<td>blue Order no. 934021</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>black Order no. 934022</td>
</tr>
</tbody>
</table>
container.blue systems are suitable for
✓ Working camps
✓ Logging camps
✓ Mining camps
✓ Temporary works
✓ Military camps
✓ Research camps
✓ Quarries

Cleaning performance
The cleaning performance was established in a practical field test lasting several weeks. The system was gradually filled with untreated domestic wastewater. In this case, the maximum filling quantity amounted to 10 m³ per day. The notified testing institute for wastewater technology (PIA GmbH) determined the cleaning performance at the test location by taking samples of the inflow and outflow.

Benefits container.blue
✓ Easy to transport (standard 20 ft container)
✓ Prefabricated, expandable design
✓ Rapid assembly and disassembly
✓ Low power consumption (1.2 kWh per 1,000 l water treated)
✓ Parallel connection for larger volumes of wastewater
✓ Virtually odourless thanks to vented tanks
✓ Less maintenance knowledge needed
✓ Plug & play, ready for immediate use

Specifications
- Equipment: 20 ft side door container
- Material: Steel
- Weight (tare): 3180 kg
- Dimensions: L 6058 mm; B 2114 mm; H 2169 mm
- Inlet DN 110, height 2310 mm
- Outlet DN 110, height 415 mm
- Ventilation DN 110, height 2310 mm
- Operating voltage: 400 V, 50 Hz (60 Hz)
- Rated current: 32 A
- Temperature range: -10°C to +35°C
- Power consumption: 10 – 12 kWh/d

Wastewater treatment data
- Inflow volume: 10 m³/d, more on request
- BOD₅ load: 4 kg/d (60 gBOD₅/inhab.*d)
- Operating time: 24 h
- Operation: Automatic

Process quality
- SS (suspended solids): < 30 mg/l
- BOD₅ (biochemical oxygen demand): < 10 mg/l
- COD (chemical oxygen demand): < 20 mg/l
- NH₄-N: < 10 mg/l
- N_total: < 20 mg/l

Technical data

Benefits container.blue

Cleaning performance

Container blue
20 ft container; up to 10,000 l/d
Order no. 160000
Webcode G5116

PIA, independent testing institute in Aachen
Powerless Wastewater Treatment Systems

- Biomatic system Page 56
- Anaerobix Page 58
- Anaerobix XL/XXL Page 60
- Carat RS Septic tank Page 62
- Cesspools Page 63
- Herkules Septic Tank and Cesspool Page 65
System comparison

<table>
<thead>
<tr>
<th>System comparison</th>
<th>Biomatic</th>
<th>Anaerobix / Anaerobix XL / Anaerobix XXL</th>
<th>Septic Tanks</th>
<th>Cesspools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>56/57</td>
<td>58–61</td>
<td>62/65</td>
<td>63–65</td>
</tr>
<tr>
<td>System conformity</td>
<td>EN 12566-3</td>
<td></td>
<td>EN 12566-1</td>
<td>—</td>
</tr>
<tr>
<td>Purifying technology</td>
<td>Sand filter bed</td>
<td>anaerobic process</td>
<td>mechanical separation</td>
<td>—</td>
</tr>
<tr>
<td>Warranty for underground tank</td>
<td>15 years</td>
<td>15 years</td>
<td>15 years</td>
<td>15 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Limit values</th>
<th>30l/40l/60l</th>
<th>50–65 %</th>
<th>—</th>
<th>—</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD5 (biochemical oxygen demand)</td>
<td>97.5 %</td>
<td>75 %</td>
<td>50–65 %</td>
<td>—</td>
</tr>
<tr>
<td>SS (suspended solids)</td>
<td>96.7 %</td>
<td>90 %</td>
<td>60–70 %</td>
<td>—</td>
</tr>
</tbody>
</table>

Anaerobix
Carat RS
Carat XL
Herkules
Platin

System Biomatic Anaerobix / Anaerobix XL / Anaerobix XXL Septic Tanks Cesspools

Warranty for underground tank
15 years
15 years
15 years
15 years

Purifying technology
Sand filter bed anaerobic process mechanical separation

Limit values
BOD5, (biochemical oxygen demand)
SS (suspended solids)

Powerless Wastewater Treatment Systems
Biomatic
Powerless System

Why use the Biomatic?
- No energy consumption
- Easy installation thanks to telescopic dome shafts
- Optimum distribution of pre-treated water
- 3 times less footprint than a traditional sand filter

How does Biomatic work?
The Biomatic compact filter is a compact, stand-alone sanitation solution that works on the principle of traditional sectors. This solution, composed of 100% GRAF products, operates in a gravitational manner and without electricity. The Biomatic modules making up the treatment system stand out from traditional sand filters because of their compactness (less than 11 m² for 6 PE).

Biomatic system

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>900</td>
<td>0.36</td>
<td>3,750</td>
<td>2590</td>
<td>2590</td>
<td>1380</td>
<td>260</td>
<td>106398</td>
</tr>
<tr>
<td>12</td>
<td>1,800</td>
<td>0.72</td>
<td>6,500</td>
<td>3890</td>
<td>5580</td>
<td>1380</td>
<td>440</td>
<td>106399</td>
</tr>
</tbody>
</table>

* Total measurement
** without pre-treatment septic tank

Technical data

<table>
<thead>
<tr>
<th>System</th>
<th>Biomatic system</th>
</tr>
</thead>
<tbody>
<tr>
<td>System conformity</td>
<td>EN 12566-3</td>
</tr>
<tr>
<td>Purifying technology</td>
<td>sand filter bed</td>
</tr>
<tr>
<td>Maintenance interval</td>
<td>1 – 2 per year</td>
</tr>
<tr>
<td>Warranty for underground tank</td>
<td>15 years</td>
</tr>
</tbody>
</table>

Example

6 Greas separator (optional 1 l/sec.)
2 Carat RS 3,750 l / 6,500 l incl. Anaerobix 60 l
4 Batch feeding tank 50 l (6 PE), 100 l (12 PE)
5 Biomatic modules / filter bed
6 Ventilation / maintenance shaft
7 Collector shaft

Simple Transport due to optimized packaging

Results of practical testing undertaken by the Centre Scientifique et Technique du Bâtiment (CSTB), Nantes

Function of the Biomatic system

Graf TV
www.graf-water.com/graf-tv
The benefits of the Anaerobix system at a glance

- Very good cleaning performance: efficiency over 90%, PIA-tested (Testing Institute for Waste Water Technology)
- No power consumed, no electrical or mechanical components (e.g. pumps or float switch) in tank
- Largely maintenance-free
- Installation in proven Graf tanks
- Easy to install with standard DN 100 pipes
- Very good value for money

Simple and low-cost

- Anaerobix is the low-cost anaerobic filter system for GRAF wastewater tanks
- Filled with the carrier material supplied, it increases the cleaning performance of a wastewater tank several times over. The large surface of the recyclable plastic carrier material (141 m²/m³) allows the biofilm responsible for the cleaning process to cover a large area.

Anaerobix single-tank system

<table>
<thead>
<tr>
<th>Inhab. [max.]</th>
<th>Max. daily flow [l/day]</th>
<th>Tank</th>
<th>Anaerobic Typ [l]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 2</td>
<td>150 – 300</td>
<td>Saphir 600 l</td>
<td>30</td>
</tr>
<tr>
<td>2 – 3</td>
<td>150 – 450</td>
<td>Saphir 900 l</td>
<td>30</td>
</tr>
<tr>
<td>2 – 3</td>
<td>300 – 600</td>
<td>Erdtank 1,000 l</td>
<td>30</td>
</tr>
<tr>
<td>3 – 4</td>
<td>450 – 750</td>
<td>FLAT 1,500 l</td>
<td>30</td>
</tr>
<tr>
<td>4 – 5</td>
<td>450 – 750</td>
<td>Cristall 4,600 l</td>
<td>40</td>
</tr>
<tr>
<td>5 – 8</td>
<td>750 – 1,200</td>
<td>Cristall 6,600 l</td>
<td>40</td>
</tr>
<tr>
<td>8 – 9</td>
<td>750 – 1,350</td>
<td>Cristall RS 2,200 l*</td>
<td>60</td>
</tr>
<tr>
<td>10 – 12</td>
<td>1,050 – 1,800</td>
<td>Cristall RS 3,750 l*</td>
<td>60</td>
</tr>
<tr>
<td>12 – 16</td>
<td>1,350 – 2,400</td>
<td>Cristall RS 4,800 l*</td>
<td>60</td>
</tr>
<tr>
<td>16 – 21</td>
<td>1,950 – 3,450</td>
<td>Cristall RS 6,500 l*</td>
<td>60</td>
</tr>
</tbody>
</table>

Scope of supply: Graf wastewater tank (tank dome and telescopic dome shaft), Anaerobix filter.

Ideal for infiltration of cleaned wastewater

>> page 88

Technical data

<table>
<thead>
<tr>
<th>System</th>
<th>Herkules</th>
<th>30 l/40 l/60 l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purifying technology</td>
<td>Anaerobic system</td>
<td>Anaerobic system</td>
</tr>
<tr>
<td>One-tank systems available up to</td>
<td>300 l/d</td>
<td>3,150 l/d</td>
</tr>
<tr>
<td>Maintenance interval</td>
<td>1 – 2 per year</td>
<td>1 – 2 per year</td>
</tr>
<tr>
<td>Warranty for underground tank</td>
<td>10 years</td>
<td>-</td>
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</tbody>
</table>

Limit values

<table>
<thead>
<tr>
<th>Herkules</th>
<th>30 l/40 l/60 l</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD₅ (Biochemical oxygen demand)</td>
<td>56.6 %</td>
</tr>
<tr>
<td>SS (suspended solids)</td>
<td>81 %</td>
</tr>
</tbody>
</table>
Anaerobix XL / XXL

### Anaerobix XL

<table>
<thead>
<tr>
<th>Inhab. [max.]</th>
<th>Anaerobix tank</th>
<th>Required vol. for pre-treatment septic tank [l]</th>
<th>Max. daily flow [l/d]</th>
<th>Carrier material [m³]</th>
<th>Qty. of bags [0,05 m³/bag]</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 – 33</td>
<td>Erdtank 1,000 l</td>
<td>10,000</td>
<td>4,950</td>
<td>0,75</td>
<td>15</td>
<td>107696</td>
</tr>
<tr>
<td>33 – 53</td>
<td>Cristall 1,600 l</td>
<td>16,000</td>
<td>7,950</td>
<td>1,5</td>
<td>30</td>
<td>107697</td>
</tr>
<tr>
<td>53 – 88</td>
<td>Cristall 2,650 l</td>
<td>32,000</td>
<td>13,200</td>
<td>2,4</td>
<td>48</td>
<td>107698</td>
</tr>
</tbody>
</table>

Scope of supply: GRAF underground tank, tank dome, telescopic dome shafts and Anaerobix XL Filter.

### Anaerobix XXL

<table>
<thead>
<tr>
<th>Inhab. [max.]</th>
<th>Anaerobix tank</th>
<th>Required vol. for pre-treatment septic tank [l]</th>
<th>Max. daily flow [l/d]</th>
<th>Carrier material [m³]</th>
<th>Qty. of bags [0,05 m³/bag]</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>Carat RS 6,500 l</td>
<td>60,000</td>
<td>10,000</td>
<td>6</td>
<td>100</td>
<td>on request</td>
</tr>
<tr>
<td>400</td>
<td>2 x Carat RS 6,500 l</td>
<td>120,000</td>
<td>20,000</td>
<td>12</td>
<td>200</td>
<td>on request</td>
</tr>
<tr>
<td>600</td>
<td>3 x Carat RS 6,500 l</td>
<td>180,000</td>
<td>30,000</td>
<td>18</td>
<td>300</td>
<td>on request</td>
</tr>
<tr>
<td>800</td>
<td>4 x Carat RS 6,500 l</td>
<td>240,000</td>
<td>40,000</td>
<td>24</td>
<td>400</td>
<td>on request</td>
</tr>
</tbody>
</table>

Further sizes on request

Scope of supply: Carat RS underground tanks, tank domes, telescopic dome shafts, accessory set for pre treatment septic tanks, accessory set for Anaerobix XXL Filter and carrier material.
Carat RS Septic Tank
Three chambers / Two chambers / One chamber

Benefits
✓ Up to 45 wastewater tanks per lorry
✓ Low weight; can also be installed in difficult local conditions without a crane
✓ Reasonable purchase and installation costs. Compare!
✓ Low maintenance; maintenance or cleaning work can be performed through the shafts
✓ Tanks can be used as rainwater harvesting systems after thorough cleaning

Floating and removable material is extracted from domestic wastewater in mechanical wastewater tanks. This is purely mechanical cleaning.

12566-1*
Hydraulic efficiency 99.9 %

*Refer to the installation instructions for CE-compliant Septic tanks

Carat RS Septic tank
Inhabitants
Total volume
Capacity
Length
Width
Height
Weight
[mm]
[kg]
[mm]
[mm]
[mm]

1 2,700 2,700 2080 1565 2010 145
7 3,750 3,750 2280 1755 2200 175
9 4,800 4,800 2280 1985 2430 220
13 6,500 6,500 2390 2190 2710 260

Scope of supply: Carat RS underground tank with baffle. Also available without baffle as a one-chamber wastewater tank.

(> page 80 – suitable covers >> page 82 – different baffle position)

Carat RS Cesspool (> page 80 – suitable covers)
Volume
Length
Width
Height
Weight
[mm]
[mm]
[mm]
[mm]
[kg]

2,200 2080 1565 2010 145
3,750 2280 1755 2200 175
4,800 2390 1985 2430 220
6,500 2390 2190 2710 260

Carat XL Cesspool (> page 80 – suitable covers)
Volume
Length
Width
Height
Weight
[mm]
[mm]
[mm]
[mm]
[kg]

8,500 3500 2040 2695 380
10,000 3520 2240 2895 456

Carat XXL Cesspool (> page 80 – suitable covers)
Volume
Length
Width
Height
Weight
[mm]
[mm]
[mm]
[mm]
[kg]

16,000 4660 2500 2550 805
36,000 9430 2500 2550 1495
56,000 14200 2500 2550 2185
76,000 18970 2500 2550 2875

Other sizes >> page 85 / up to 122,000 litres on request

Cesspools

Benefits
✓ Easy installation due to low net weight
✓ The tank can also be used as a rainwater collection tank after cleaning
✓ Can be expanded as required.
✓ Self-anchoring

15 year warranty
CE

Accessories
Inspection end DN 200
Deaeration end DN 100
Order no. 340527
Order no. 369017

Presenting the Carat wastewater tank
www.graf-water.com/graf-tv

Webcode G5504

Carat RS Cesspool
Inhabitants
Total volume
Capacity
Length
Width
Height
Weight
[mm]
[mm]
[mm]
[mm]
[mm]
[kg]

1 2,700 2,700 2080 1565 2010 145
7 3,750 3,750 2280 1755 2200 175
9 4,800 4,800 2280 1985 2430 220
13 6,500 6,500 2390 2190 2710 260

Scope of supply: Carat RS underground tank with baffle. Also available without baffle as a one-chamber wastewater tank.

(> page 80 – suitable covers >> page 82 – different baffle position)

Carat XL Cesspool (> page 80 – suitable covers)
Volume
Length
Width
Height
Weight
[mm]
[mm]
[mm]
[mm]
[kg]

8,500 3500 2040 2695 380
10,000 3520 2240 2895 456

Carat XXL Cesspool (> page 80 – suitable covers)
Volume
Length
Width
Height
Weight
[mm]
[mm]
[mm]
[mm]
[kg]

16,000 4660 2500 2550 805
36,000 9430 2500 2550 1495
56,000 14200 2500 2550 2185
76,000 18970 2500 2550 2875

Other sizes >> page 85 / up to 122,000 litres on request

Webcode G5409

Webcode G5410

Accessories
Overflow guard
Emits visual and audio alarm, battery-operated (9 V).
Order no. 311017

Odour filter for ventilation shaft
Reliably filters out unpleasant odours.
Order no. 204018

Special seal DN 100
For connections
Order no. 332033

Drill DN 100
With view shaft
Order no. 200003
Cesspools

Benefits
✓ Can be installed in groundwater
✓ Shallow installation
✓ Easy installation due to low net weight
✓ The tank can also be used as a rainwater collection tank after cleaning.
✓ Can be expanded as required

Volume

<table>
<thead>
<tr>
<th>Volume [l]</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500</td>
<td>390000</td>
</tr>
<tr>
<td>3,000</td>
<td>390001</td>
</tr>
<tr>
<td>5,000</td>
<td>390002</td>
</tr>
<tr>
<td>7,500</td>
<td>390003</td>
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</tbody>
</table>

Platin Cesspool

Volume

<table>
<thead>
<tr>
<th>Volume [l]</th>
<th>Width B [mm]</th>
<th>Length L [mm]</th>
<th>Height H [mm]</th>
<th>Height Htot [mm]</th>
<th>Height of dome shaft h [mm]</th>
<th>Internal Ø of dome shaft t [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500</td>
<td>1250</td>
<td>2100</td>
<td>700</td>
<td>1055</td>
<td>315</td>
<td>650</td>
<td>82</td>
</tr>
<tr>
<td>3,000</td>
<td>2100</td>
<td>2450</td>
<td>735</td>
<td>1050</td>
<td>315</td>
<td>650</td>
<td>180</td>
</tr>
<tr>
<td>5,000</td>
<td>2300</td>
<td>2890</td>
<td>950</td>
<td>1265</td>
<td>315</td>
<td>650</td>
<td>250</td>
</tr>
<tr>
<td>7,500</td>
<td>2550</td>
<td>3600</td>
<td>1250</td>
<td>1585</td>
<td>315</td>
<td>650</td>
<td>360</td>
</tr>
</tbody>
</table>

Technical data

Max. earth covering (without groundwater vehicle loading) 1200mm
Max. axle load 2.2t
Max. total weight 3.5t
Earth covering required for vehicle loading 700 mm – 1000 mm
Groundwater stability up to tank shoulder
Earth covering required for groundwater stability 700 mm – 1200 mm
Connection 4 x DN 100

Herkules Septic Tank / Cesspool

For overground and underground installation

Benefits
✓ Stability tested according to European standard (DIN EN 12566-3)
✓ Construction approved by DIBt for domestic wastewater
✓ Can be installed in groundwater
✓ Fits through any door (80 cm) – each half-shell weighs just 30 kg
✓ Fast tank fitting with profile seal and fast connectors
✓ Tanks can be used for rainwater harvesting systems after thorough cleaning
✓ Can be expanded as required

Herkules tank 1,600 l
Order no. 320001

Technical data

<table>
<thead>
<tr>
<th>Total volume [l]</th>
<th>Volume [l]</th>
<th>Height [mm]</th>
<th>Ø max. [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herkules – Septic tank (three chambers)</td>
<td>4,800</td>
<td>1,600</td>
<td>1600</td>
<td>1350</td>
</tr>
<tr>
<td>Herkules – Septic tank (two chambers)</td>
<td>3,200</td>
<td>1,600</td>
<td>1600</td>
<td>1350</td>
</tr>
<tr>
<td>Herkules – Septic tank (one chamber)</td>
<td>1,600</td>
<td>1,600</td>
<td>1600</td>
<td>1350</td>
</tr>
<tr>
<td>Herkules – Cesspool</td>
<td>1,600</td>
<td>1,600</td>
<td>1600</td>
<td>1350</td>
</tr>
</tbody>
</table>

Accessories

Tank dome DN 200
With telescopic end, length 1 m
Order no. 320226

Extension set
2 x seal DN 100 without connection pipe
Order no. 222228

Drill DN 100
With view shaft
Order no. 222003

Unbeatable advantages:

Long-lasting
DURAZUR®_long lasting thanks to solid profile sealing (life expectancy of more than 25 years proven in laboratory tests).

Can be extended as desired
Shape-matched end connectors and connection surfaces enable volumes of several 10,000 l

Easy transport
Thanks to low weight of 30 kg per half-shell & practical size, fits through all doorways (up to 80 cm)

Stackable
Can be extended as required
More information
Can be found in our light fluid and grease separator salesfolder.
In operations where wastewater contains grease, it must be treated separately using a separator before being discharged to the sewer system. A grease separator works by the force of gravity. It consists of a precipitation area, a grease collector, a sludge trap and a sampling point. The system reduces the flow rate of the wastewater to allow solids to sink and settle in the sludge trap, fats, which have a lower density than water, float to the surface. Once the grease is removed, the wastewater flows to the sewer system. The choice of nominal size for the separator is specified in EN 1825 part 2. The wastewater requirements of the relevant authority must be complied with (e.g. 14-day emptying; monthly emptying with the approval of the relevant authority).

### Dimensions Saphir

<table>
<thead>
<tr>
<th>NS [l/s]</th>
<th>Ø DN [mm]</th>
<th>Ø Tank body [mm]</th>
<th>Height [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>1125</td>
<td>3500 – 3600</td>
<td>41</td>
</tr>
<tr>
<td>(0.26 US gal./s)</td>
<td>(4&quot;)</td>
<td>(45&quot;)</td>
<td>(141&quot;) – (143&quot;)</td>
<td>(90 lbs)</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>1125</td>
<td>3500 – 3600</td>
<td>41</td>
</tr>
<tr>
<td>(0.52 US gal./s)</td>
<td>(4&quot;)</td>
<td>(45&quot;)</td>
<td>(141&quot;) – (143&quot;)</td>
<td>(90 lbs)</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>1155</td>
<td>3700 – 3970</td>
<td>70</td>
</tr>
<tr>
<td>(0.52 US gal./s)</td>
<td>(4&quot;)</td>
<td>(45&quot;)</td>
<td>(148&quot;) – (158&quot;)</td>
<td>(134 lbs)</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>1155</td>
<td>3700 – 3970</td>
<td>70</td>
</tr>
<tr>
<td>(0.52 US gal./s)</td>
<td>(4&quot;)</td>
<td>(45&quot;)</td>
<td>(148&quot;) – (158&quot;)</td>
<td>(134 lbs)</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>1155</td>
<td>2110 – 2290</td>
<td>400</td>
</tr>
<tr>
<td>(0.52 US gal./s)</td>
<td>(4&quot;)</td>
<td>(45&quot;)</td>
<td>(6' 11&quot;) – (7' 2&quot;)</td>
<td>(880 lbs)</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>1155</td>
<td>2110 – 2290</td>
<td>400</td>
</tr>
<tr>
<td>(0.52 US gal./s)</td>
<td>(4&quot;)</td>
<td>(45&quot;)</td>
<td>(6' 11&quot;) – (7' 2&quot;)</td>
<td>(880 lbs)</td>
</tr>
</tbody>
</table>

### Dimensions Diamant

<table>
<thead>
<tr>
<th>NS [l/s]</th>
<th>Ø DN [mm]</th>
<th>Length [mm]</th>
<th>Width [mm]</th>
<th>Height [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>150</td>
<td>2450</td>
<td>1150</td>
<td>1845 – 2115</td>
<td>165</td>
</tr>
<tr>
<td>(1.05 US gal./s)</td>
<td>(6&quot;)</td>
<td>(97&quot;)</td>
<td>(45&quot;)</td>
<td>(72&quot;) – (78&quot;)</td>
<td>(364 lbs)</td>
</tr>
<tr>
<td>7</td>
<td>150</td>
<td>2450</td>
<td>1150</td>
<td>1845 – 2125</td>
<td>165</td>
</tr>
<tr>
<td>(1.81 US gal./s)</td>
<td>(6&quot;)</td>
<td>(97&quot;)</td>
<td>(45&quot;)</td>
<td>(72&quot;) – (78&quot;)</td>
<td>(364 lbs)</td>
</tr>
<tr>
<td>10</td>
<td>200</td>
<td>2450</td>
<td>1400</td>
<td>2095 – 2310</td>
<td>250</td>
</tr>
<tr>
<td>(3.64 US gal./s)</td>
<td>(8&quot;)</td>
<td>(97&quot;)</td>
<td>(47&quot;)</td>
<td>(81&quot;) – (92&quot;)</td>
<td>(551 lbs)</td>
</tr>
<tr>
<td>15</td>
<td>200</td>
<td>2450</td>
<td>1400</td>
<td>2095 – 2310</td>
<td>250</td>
</tr>
<tr>
<td>(5.95 US gal./s)</td>
<td>(8&quot;)</td>
<td>(97&quot;)</td>
<td>(47&quot;)</td>
<td>(81&quot;) – (92&quot;)</td>
<td>(551 lbs)</td>
</tr>
</tbody>
</table>

### Tank volume

<table>
<thead>
<tr>
<th>Grease [l]</th>
<th>Sludge [l]</th>
<th>Total [l]</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>(52 US gal.)</td>
<td>(52 US gal.)</td>
<td>(132 US gal.)</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>(52 US gal.)</td>
<td>(52 US gal.)</td>
<td>(132 US gal.)</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>(52 US gal.)</td>
<td>(52 US gal.)</td>
<td>(132 US gal.)</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>(52 US gal.)</td>
<td>(52 US gal.)</td>
<td>(132 US gal.)</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>(52 US gal.)</td>
<td>(52 US gal.)</td>
<td>(132 US gal.)</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>(52 US gal.)</td>
<td>(52 US gal.)</td>
<td>(132 US gal.)</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>(52 US gal.)</td>
<td>(52 US gal.)</td>
<td>(132 US gal.)</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>(52 US gal.)</td>
<td>(52 US gal.)</td>
<td>(132 US gal.)</td>
</tr>
</tbody>
</table>

**Tank covers**

- on request
Light Fluid Separator

Saphir and Diamant

Separator systems for light fluid liquids class I + II

Separators are needed wherever water is contaminated with oils and other light liquids. Separator systems are classified according to NS (nominal size). When you submit an enquiry for a separator, we calculate the NS you require based on the EN 858 part 2. Operators of the following facilities must ensure that a suitable, functioning separator is installed: Car washes, workshops, fuel stations, vehicle fleets, hazardous goods stores.

Coalescence separator and fuel separator

The sepa.compact separator systems are fuel separators of class I. They feature an additional coalescence unit that enables a much higher degree of separation. The sepa.compact separator systems are fuel separators of class II. A fuel separator achieves a degree of separation of less than 10 mg residual oil per litre of water. With a coalescence unit, this can be reduced to less than 5 mg/l.

Light fluid separator

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Dimensions Saphir

<table>
<thead>
<tr>
<th>NS [l/h]</th>
<th>DN [mm]</th>
<th>Length [mm]</th>
<th>Width [mm]</th>
<th>Height [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>150</td>
<td>1455</td>
<td>1155</td>
<td>2110 – 2310</td>
<td>110</td>
</tr>
<tr>
<td>6</td>
<td>150</td>
<td>1455</td>
<td>1155</td>
<td>2110 – 2310</td>
<td>110</td>
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</table>

Dimensions Diamant

<table>
<thead>
<tr>
<th>NS [l/h]</th>
<th>DN [mm]</th>
<th>Length [mm]</th>
<th>Width [mm]</th>
<th>Height [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>150</td>
<td>2450</td>
<td>1150</td>
<td>1755 – 2055</td>
<td>165</td>
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<td>10</td>
<td>150</td>
<td>2450</td>
<td>1150</td>
<td>1755 – 2055</td>
<td>165</td>
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</table>

Tank volume

<table>
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<tr>
<th>Oil [l]</th>
<th>Sludge [l]</th>
<th>Total [l]</th>
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<tbody>
<tr>
<td>300</td>
<td>600</td>
<td>900</td>
</tr>
<tr>
<td>500</td>
<td>800</td>
<td>1,300</td>
</tr>
<tr>
<td>700</td>
<td>1,100</td>
<td>1,800</td>
</tr>
</tbody>
</table>

Effectiveness according to EN 858 tested by TÜV Rheinland.

Function of Light fluid separator

1 Coalescence unit included with sepa.compact+ system
2 Integrated sampling connecting point
3 Warming sensors
4 Tank covers on request
5 Optional: different warning systems available

To separate out these smaller droplets, a coalescence material is fitted before the discharge to which the droplets stick and form a oil film.

In addition to easily separable drops of oil, a light fluid separator can also contain very fine oil droplets whose density is not sufficiently different from the water for them to rise to the surface in the available time. These droplets therefore remain in the outflowing water.

As more oil flows in, the film becomes thicker until it can no longer adhere to the material. Individual drops break off the film, which are large enough to rise to the surface through difference in density and be separated out.
Cara Undergroud Tank

- Carat RS underground tank
- Carat XL underground tank
- Carat XXL underground tank
Carat RS Underground Tank – The GRAF Modular System
Choose your system from four different modulars

Tank (page 76–79)
The Carat RS underground tank is the basis for the modular system. It is available in sizes from 2,700 to 6,500 litres and in combined sizes of up to 13,000 litres. Its high quality makes it suitable for vehicle loading and installation in groundwater.

Tank cover (page 80–81)
Would you like to install your tank in the garden or in a driveway? GRAF offers you a wide range of telescopic tank covers from plastic to cast iron.

Baffles (page 82)
The baffle separates the Carat RS underground tank into two or three chambers as desired. This means that wastewater treatment systems with multiple chambers can be accommodated in just one tank. A Carat RS underground tank with baffle is ready for use as a multi-chamber tank.

System packs (page 83)
There are different types of system packs available. The system pack consists of a control unit (internal or external cabinet) and a set-up kit, which is assembled inside the Carat RS tank.

Tank
Carat RS 2,700 – 6,500 litres
- Carat RS 2,700 litres
  Order no. 372028
- Carat RS 3,750 litres
  Order no. 372029
- Carat RS 4,800 litres
  Order no. 372030
- Carat RS 6,500 litres
  Order no. 372031

Tank cover
- Telescopic dome shaft Mini
  Order no. 371020
- Telescopic dome shaft Maxi
  Order no. 371011
- Telescopic dome shaft cast iron
  Order no. 371021
- Extension
  Order no. 371003

Baffles
- Baffles – Carat RS 2,700 – 6,500 litres
  Order no. 375067
- Baffles – Carat RS 3,750 litres
  Order no. 375026
- Baffles – Carat RS 6,500 litres
  Order no. 375027

System packs
- Anaerobix
- Klaro E Professional (Klaro L)
- one2clean
- one2clean plus
- Telescopic dome shaft cast iron
  Order no. 371021
Carat RS Underground Tank – Benefits

Benefits
✓ Made of 100% recycling material
✓ Investment security thanks to 15-year warranty — compare it!
✓ Very high stability thanks to modern production methods
✓ Suitable for vehicle loading (when combined with the cast iron telescopic tank dome)
✓ Groundwater-stable thanks to its extremely stable construction
✓ Can be expanded as required

Flush with ground level
✓ Numerous seals to effectively stop dirt getting into the tank
✓ Seals are fitted in the intersection between the tank and tank dome and between the tank dome and telescopic tank dome
✓ The height of the telescopic tank dome can be smoothly adjusted
✓ The telescopic tank dome can additionally be inclined by 5° to suit the local conditions
✓ The production tolerances are kept to a minimum, resulting in unrivalled fitting accuracy

Extremely stable thanks to the numerous ribs
✓ Ribbed tank base
✓ Unlike other underground tanks, the wall thickness can be precisely defined and is equal in all areas of the tank
✓ Impact-resistant
✓ Encircling stabilisation ring in unique H
✓ Unique profile for more stability and security

Easy and safe assembly
✓ Quick connection (shown in green) allows the Carat RS tank to be assembled without screws in only a few minutes
✓ The top-quality EPDM material used in the profile seals (shown in yellow) has been laboratory-tested
✓ The centring bolt (shown in orange) ensures the accurate and easy assembly of the two half-shells, preventing any leaks
Tank

Carat RS Underground Tank – Benefits

Logistical Advantages

Benefits
- Easy to transport
- Tank consisting of two half-shells
- 5 – 9 tanks per pallet
- This allows up to 8 times more tank volume to be shipped thanks to the unique product design
- Up to 36 complete wastewater systems or 45 wastewater tanks per lorry

Illustration shows 4,800 litre tank with telescopic dome shaft for pedestrian loading

Dimensions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2,700 (700 US gal.)</td>
<td>1565 (61.6&quot;)</td>
<td>2080 (81.9&quot;)</td>
<td>1400 (55.1&quot;)</td>
<td>2010 (79.1&quot;)</td>
<td>610 (24.0&quot;)</td>
<td>650 – 800 (265 lbs)</td>
<td>120</td>
<td>372028</td>
</tr>
<tr>
<td>3,750 (1,000 US gal.)</td>
<td>1755 (69.1&quot;)</td>
<td>2280 (89.8&quot;)</td>
<td>1590 (62.6&quot;)</td>
<td>2200 (86.6&quot;)</td>
<td>610 (24.0&quot;)</td>
<td>650 – 800 (265 lbs)</td>
<td>150</td>
<td>372029</td>
</tr>
<tr>
<td>4,800 (1,250 US gal.)</td>
<td>1985 (78.2&quot;)</td>
<td>2520 (98.8&quot;)</td>
<td>1820 (71.6&quot;)</td>
<td>2430 (95.7&quot;)</td>
<td>610 (24.0&quot;)</td>
<td>650 – 800 (265 lbs)</td>
<td>185</td>
<td>372030</td>
</tr>
<tr>
<td>6,500 (1,700 US gal.)</td>
<td>2190 (86.2&quot;)</td>
<td>2390 (94.1&quot;)</td>
<td>2100 (82.7&quot;)</td>
<td>2710 (106.7&quot;)</td>
<td>610 (24.0&quot;)</td>
<td>650 – 800 (265 lbs)</td>
<td>220</td>
<td>372031</td>
</tr>
</tbody>
</table>

Technical data

Max. earth covering (without groundwater vehicle loading) 1200mm (47.2")
Max. vehicle weight 12 to (2645.6 lbs)
Earth covering required for vehicle loading 800 – 1200mm (31.5 – 47.2")
Groundwater stability Up to 350mm (13.8")
Earth covering required for groundwater stability 800 – 1200mm (31.5 – 47.2")
Connection DN 100 / DN 150 / DN 200 on top

UPTO 8 TIMES MORE TANK VOLUME PER TRUCK / CONTAINER

CO²

1. PLATZ
Carat RS Underground Tank
Choose your tank domes and covers

**Tank dome Micro**
- Weight: 7 kg
- including green lid
- for shallow excavation
- earth cover only 30 mm
Order no. 371009

**Tank dome Maxi**
- Weight: 15 kg
- suitable for pedestrian loading
- adjustable earth covering across upper tank surface
- incl. 5 edge seals
Order no. 371011

**Tank dome Mini**
- Weight: 11 kg
- for especially flat installation
- incl. 3 edge seals
Order no. 371041

**Extension for shafts and domes**
- Weight: 6 kg
- The earth covering can be raised 300 mm using the extension
Order no. 371003

**Telescopic dome shaft Mini**
- with PP cover
- suitable for pedestrian loading
- Weight: 9 kg
- adjustable earth covering across upper tank surface
- plus 140 mm - 340 mm earth covering
Order no. 371010

**Telescopic dome shaft Maxi**
- with PP cover
- suitable for pedestrian loading
- Weight: 15 kg
- adjustable earth covering across upper tank surface
- plus 140 mm - 440 mm earth covering
Order no. 371021

**Telescopic dome shaft cast-iron**
- Suitable for vehicle loading – with childproof cast iron cover up to 3.5 t
- Weight: 55 kg
- adjustable earth covering across upper tank surface
- plus 140 mm – 440 mm earth covering
Order no. 371022

**Telescopic dome shaft concrete cast-iron**
- Suitable for vehicle / lorry-bearing
- Weight: 11 kg
- Cover to be provided on site
- Adjustable earth covering across upper tank surface
- For commercially available concrete rings/covers (to be provided on site)
- plus 140 mm – 440 mm earth covering
Order no. 371023

*on request

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Otto Graf GmbH
Carat RS Underground Tank

Choose your baffle position

The baffle separates the Carat RS underground tank into two or three chambers as desired. It consists of two halves and is simple to insert when assembling the second tank half of the Carat RS. A profile seal provides reliable and permanent separation of the chambers. The Carat RS underground tank with baffle is ready for use as a multi-chamber tank. This can then be expanded by means of a system pack to create a wastewater treatment system (page 58). The system pack is simply fitted to the baffle and the control unit is installed in the house – and the wastewater treatment system is ready to go.

### Baffle for Carat RS tank

<table>
<thead>
<tr>
<th>Volume (l)</th>
<th>pcs/pal</th>
<th>Positions</th>
<th>Weight (kg)</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>9</td>
<td>1/2</td>
<td>20</td>
<td>375042</td>
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<tr>
<td>2,700</td>
<td>9</td>
<td>1/3</td>
<td>20</td>
<td>375072</td>
</tr>
<tr>
<td>3,750</td>
<td>7</td>
<td>1/2</td>
<td>25</td>
<td>375026</td>
</tr>
<tr>
<td>3,750</td>
<td>7</td>
<td>1/3</td>
<td>25</td>
<td>375089</td>
</tr>
<tr>
<td>4,800</td>
<td>5</td>
<td>several positions</td>
<td>35</td>
<td>375026</td>
</tr>
<tr>
<td>6,500</td>
<td>5</td>
<td>several positions</td>
<td>45</td>
<td>375027</td>
</tr>
</tbody>
</table>

**Flexible baffle positions**

Examples of different baffle positions.

Carat RS Underground Tank

Choose your system pack

**System pack one2clean / one2clean plus**

The system pack one2clean (page 10) works according to the SBR air lift pump process. This requires a wastewater tank with a Saum baffle. Scope of supply: control cabinet with air compressor for internal mounting, one2clean system pack comprising air lift pumps and disk diffuser. Air hose not included.

**SBR hose package**

Includes: 1 x Ø 19 mm and 1 x Ø 13 mm PVC hose; colour-coded

- 10 m Order no. 107686
- 20 m Order no. 107688

**System pack Klaro E Professional**

The system pack Klaro E Professional (page 18) works according to the SBR air lift pump process. This requires a wastewater tank with two chambers. Scope of supply: control cabinet with air compressor for internal mounting, Klaro E Professional system pack comprising air lift pumps and disk diffuser. Air hose not included.

**SBR hose package**

Includes: 1 x Ø 19 mm and 1 x Ø 13 mm PVC hose; colour-coded

- 10 m Order no. 107686
- 20 m Order no. 107688

**Anaerobix**

The filter system Anaerobix (page 58) is an anaerobic filter system (filled with carrier material) for GRAF wastewater tanks. It increases the cleaning performance of a wastewater tank several times over. Scope of supply: GRAF wastewater tank with Anaerobix filter.

**System packs**

- **Klaro E Professional**
- **one2clean**

---

Anaerobix

The filter system Anaerobix (page 58) is an anaerobic filter system (filled with carrier material) for GRAF wastewater tanks. It increases the cleaning performance of a wastewater tank several times over. Scope of supply: GRAF wastewater tank with Anaerobix filter.

**Carat RS Underground Tank**

Choose your system pack

For one-tank systems

<table>
<thead>
<tr>
<th>Inhabitants (max.)</th>
<th>Volume (l)</th>
<th>System packs (Order no.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2,700</td>
<td>106850 / 104417</td>
</tr>
<tr>
<td>5</td>
<td>3,750</td>
<td>106814 / 104418</td>
</tr>
<tr>
<td>7</td>
<td>4,800</td>
<td>106852 / 104419</td>
</tr>
<tr>
<td>9</td>
<td>6,500</td>
<td>106851 / 104420</td>
</tr>
</tbody>
</table>

**SBR hose package**

Includes: 1 x Ø 19 mm and 1 x Ø 13 mm PVC hose; colour-coded

- 10 m Order no. 107686
- 20 m Order no. 107688

---

For two-tank systems

<table>
<thead>
<tr>
<th>Inhabitants (max.)</th>
<th>Volume (l)</th>
<th>System packs (Order no.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>2 x 2,700</td>
<td>106854 / 104425</td>
</tr>
<tr>
<td>10</td>
<td>2 x 3,750</td>
<td>106855 / 104426</td>
</tr>
<tr>
<td>14</td>
<td>2 x 4,800</td>
<td>106856 / 104427</td>
</tr>
<tr>
<td>18</td>
<td>2 x 6,500</td>
<td>106857 / 104428</td>
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**Sizes**

For multitank systems

<table>
<thead>
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<th>Inhabitants (max.)</th>
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<tbody>
<tr>
<td>16</td>
<td>2 x 3,750</td>
<td>107296 / 107295</td>
</tr>
<tr>
<td>22</td>
<td>2 x 4,800</td>
<td>107297 / 107295</td>
</tr>
<tr>
<td>28</td>
<td>2 x 6,500</td>
<td>107298 / 107295</td>
</tr>
<tr>
<td>32</td>
<td>4 x 3,750</td>
<td>107299 / 107247</td>
</tr>
<tr>
<td>44</td>
<td>4 x 4,800</td>
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</tr>
<tr>
<td>50</td>
<td>4 x 6,500</td>
<td>107301 / 107247</td>
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For Klaro L

<table>
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<tr>
<td>60</td>
<td>4 x 6,500</td>
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<td>90</td>
<td>5 x 6,500</td>
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</tr>
<tr>
<td>120</td>
<td>7 x 6,500</td>
<td>372712</td>
</tr>
<tr>
<td>150</td>
<td>9 x 6,500</td>
<td>372713</td>
</tr>
<tr>
<td>180</td>
<td>10 x 6,500</td>
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---

For one-tank systems

<table>
<thead>
<tr>
<th>Inhabitants (max.)</th>
<th>Volume (l)</th>
<th>System packs (Order no.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2,700</td>
<td>106850 / 106417</td>
</tr>
<tr>
<td>5</td>
<td>3,750</td>
<td>106851 / 106418</td>
</tr>
<tr>
<td>7</td>
<td>4,800</td>
<td>106852 / 106419</td>
</tr>
<tr>
<td>9</td>
<td>6,500</td>
<td>106851 / 106420</td>
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</table>

---

For two-tank systems

<table>
<thead>
<tr>
<th>Inhabitants (max.)</th>
<th>Volume (l)</th>
<th>System packs (Order no.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>2 x 2,700</td>
<td>106854 / 106425</td>
</tr>
<tr>
<td>10</td>
<td>2 x 3,750</td>
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<td>14</td>
<td>2 x 4,800</td>
<td>106856 / 106427</td>
</tr>
<tr>
<td>18</td>
<td>2 x 6,500</td>
<td>106857 / 106428</td>
</tr>
</tbody>
</table>

---

Further sizes on request
Carat XL Underground Tank
8,500 and 10,000 litres

Benefits

- Suitable for loading up to 12 t
- Can be mounted in groundwater
- Lower weight than concrete and steel
- Various connection surfaces DN 100 / 150 / 200
- Investment security thanks to a 15-year warranty

Dimensions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8,500</td>
<td>2040</td>
<td>3550</td>
<td>2085</td>
<td>2695</td>
<td>610</td>
<td>380</td>
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<tr>
<td>10,000</td>
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<td>3530</td>
<td>2285</td>
<td>2895</td>
<td>610</td>
<td>456</td>
<td>370008</td>
</tr>
</tbody>
</table>

Technical data

Max. earth covering (without groundwater vehicle loading) 2000 mm (6’ 6.7”)
Max. axle load: 3.5 to (7716 lbs) with 2.2 to cast iron cover, 12 t (26456 lbs) with telescopic dome shaft lorry
Max. total weight: 12 t (26456 lbs)
Earth covering required for vehicle loading: 800 mm – 2000 mm (31.5” – 6’ 6.7”)
Groundwater stability: up to middle of tank
Earth covering required for groundwater stability: 800 mm – 1800 mm (31.5” – 3’ 10.9”)
Connection: 5 x DN 150 (6”) + 2 x DN 200 (8”) (on top)

Carat XXL Underground Tank
up to 122,000 litres

Benefits

- Suitable for loading up to 40 t
- Can be mounted in groundwater
- Lower weight than concrete and steel
- Various connection surfaces DN 100 / 150 / 200
- Available with DN 300 connection as an option
- Available with a second tank dome as an option
- Investment security thanks to a 15-year warranty

Dimensions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16,000</td>
<td>2500</td>
<td>4660</td>
<td>2550</td>
<td>3160</td>
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<td>380006</td>
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<td>26,000</td>
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<td>7445</td>
<td>2550</td>
<td>3160</td>
<td>610</td>
<td>1125</td>
<td>380007</td>
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<td>1380</td>
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<td>650</td>
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</table>

Technical data

Max. earth covering: 1500 mm (4’ 11”)
Max. axle load: 8 t (17637 lbs)
Max. vehicle weight: 3.5 to (7716 lbs) with 2.2 to cast iron cover, 40 t (88183 lbs) with telescopic dome shaft lorry
Earth covering required for vehicle loading: 800 – 1500 mm (31.5” – 4’ 11”) vehicle loading
Groundwater stability: up to middle of the tank
Earth covering required for groundwater stability: 800 mm – 1800 mm (31.5” – 3’ 10.9”)
Connection: 5 x DN 150 (6”) (or 10 x 5 x DN 150 (6”)+ DN 200 (8”) on top; Optionally up to DN 300 (12”)

Illustration shows Carat XXL 46,000 l with telescopic dome shaft suitable for loading.
Infiltration

Infiltration Tunnel
The Graf Infiltration Tunnel has been mainly designed for the use in private and rural areas. The system, which consists of one or more tunnel modules and two end plates, can be extended as desired. The tunnel is laid in one or more lines of the same level. As the weight of one module is only 11 kg, the handling of the Infiltration Tunnel is excellent. The surface above the tunnels is suitable for vehicle loading, offering varied possibilities for use.

Up to 12,000 litres infiltration volume per pallet

Thanks to its special design, the GRAF Infiltration Tunnel can be stacked easily. Consequently, the shipment of up to 40 Infiltration Tunnels on one pallet saves considerable transport and storage costs.

Vehicle loading

For versatility, the surface above the infiltration tunnels can withstand a continuous load of up to 100 kN/m² and is therefore also suitable for vehicle loading.

Easy installation

The GRAF Infiltration Tunnels are laid in lines and can be flexibly adapted to specific conditions and to the individual storage volume requested. The installation of the modules is easy, quick and variable. Installation is possible without heavy equipment, as one Infiltration Tunnel weighs just 11 kg. The tunnel modules are simply joined together in a line and two end plates are fitted per line.

Flexible connection options

DN 100/200 (4”/8”)

The special construction of the GRAF Infiltration Tunnel guarantees lasting, high infiltration performance.

Infiltration Tunnel lorry

<table>
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<tr>
<th>Volume</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
<th>Weight</th>
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<tr>
<td>300 l</td>
<td>1,160 mm (45.7”)</td>
<td>800 mm (31.5”)</td>
<td>510 mm (20”)</td>
<td>11 kg (24.4 lbs)</td>
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End plate for Infiltration Tunnel / Twin

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<td>End plates (Set of 2 units)</td>
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Inspection end

DN 200 (8”)
Order no. 349037

Deaeration end

DN 100 (4”)
Order no. 369017

GRAF-Tex geotextile

For an Infiltration Tunnel size of 2.50 x 2.50 m (8’ 2.4” x 8’ 2.4”)
Order no. 23006

Roll width 5 m (16’ 4.8”)
Order no. 231002
Internationally proven:
GRAF Wastewater Treatment Systems

10 inhabitants, Julita (Sweden)
50 inhabitants, Šuškova (Latvia)
50 inhabitants, Saalburg (Germany)
50 inhabitants, Uurainen (Finland)
35 inhabitants, Le Mans (France)
46 inhabitants, Cuenca (Spain)
140 inhabitants, Mexico City (Mexico)
32 inhabitants, British Columbia (Canada)
130 inhabitants, Saalburg (Germany)
46 inhabitants, Cuenca (Spain)
10 inhabitants, Julita (Sweden)
35 inhabitants, Le Mans (France)
90 inhabitants, Tehran (Iran)
6 inhabitants, Landsveit (Iceland)
4 inhabitants, Döbeln (Germany)
15 inhabitants, Fürenalp (Switzerland)
7 inhabitants, Tiflis (Georgia)
155 inhabitants, Le Pasquier (France)
60 inhabitants, Sofia (Bulgaria)
200 inhabitants, Rudenki Town (Ukraine)
Stormwater Management

For more information about our stormwater management, ask for our catalogue.

www.graf.info
Rainwater Harvesting Solutions

For more information about our Rainwater Harvesting Solutions, ask for our catalogue.

Prices:
A price list with our export conditions is available on request.

Warranty clause:
The warranty mentioned in this brochure only refers to the tank in question and not to the accessories. Within the warranty period we grant free replacement of the material. Further benefits are excluded. Pre-condition for warranty benefits are proper handling, assembly and installation according to the mounting guidelines.

Over and above the statutory regulation, GRAF is lengthening the warranty period for a number of underground tanks. This relates to proper handling, assembly and installation in accordance with the installation manual, as well as leakproofness, usability and static safety. The prerequisites of this are competent assembly and operation in accordance with the requirements, namely the currently valid installation and operating instructions and the prevailing standards.

N.B. Protect tanks from frost when installed aboveground! In case of groundwater installation, please contact us for further information previous to the purchase!

For all indications of measurements in this brochure we reserve a tolerance of +/- 3%. The useful volume of the tanks may be up to 10% lower than the tank capacity, according to the connecting option.

Technical modifications and further development of the different products are subject to change. Errors excepted.

For all our offers and conclusions of contract are only valid our General Terms and Conditions of Business dated 01/10/2012 which we will send to you on request.