



Wastewater Treatment

GRAF Advanced Wastewater Treatment System

Benefits of the Graf system

- Extremely strong & robust injection moulded underground tank
- No concrete required, just gravel base and backfill
- Completely groundwater stable up to the centre line
- CE Certified system to EN 12566-3
- Great effluent quality of 12, 20, 12 guaranteed on a 95 percentile basis up to 50 PE using SBR Technology.
- Integrated sampling chamber at no extra cost
- No moving parts inside the tank, easy to install, easy to maintain.
- Plug in and play system, no wiring required
- 10 year warranty on the tank, 2 years on compressor and parts, German engineered
- Low energy consumption of just 46 kWh per person, per year
- Quiet operation
- Automatic holiday mode with under load detection and flood alert
- Convenience package +K control with larger display and keypad
- Underload detection by a pressure sensor in the control
- Multiple upgrades available including remote transmission, phosphate & nitrogen removal and complete disinfection with UV



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Wastewater Treatment Solutions

WASTEWATER TREATMENT SYSTEMS & SEPTIC TANKS



ADVANCED WASTEWATER TREATMENT SYSTEMS

ONE 2 CLEAN

SEPTIC TANKS

Welcome to Graf UK

By Matthew Rolph, Managing Director, Graf UK



World's largest injection moulding machine

For more than 50 years, the GRAF brand has represented high-quality plastic products. Our Carat wastewater tanks represent the state of the art. Our long-standing partner KLARO, which joined our group of companies in 2014, has grown over the last 10 years to become the European market leader in small SBR treatment systems with airlift technology. Our small wastewater treatment systems are already being used by 240,000 satisfied customers. When you buy a GRAF wastewater treatment system, you benefit from the experience gained from more than 300,000 satisfied wastewater customers and the quality of two established brands in local wastewater disposal.

Quality comes first

GRAF uses state-of-the-art production facilities. This is the only way to guarantee superlative quality at attractive prices. A high standard of quality in production is an essential foundation for unique products. End-to-end quality assurance and a high level of automation guarantee maximum reliability in production. GRAF broke into new ground by using injection embossing to make the Carat wastewater tank. To manufacture this tank, GRAF commissioned the development and construction of the world's largest injection moulding machine.



Blow moulding



Rotational moulding

How to choose a wastewater treatment system

Wastewater solutions for:

e.g. domestic properties



- **one2clean one-tank system** (>> page 6)
- **Septic tank** (>> page 15)
- **Anaerobix** (>> page 15)

Wastewater solutions for:

e.g. villages, office buildings, campsites, hotels



- **one2clean two-tank system** (>> page 6)
- **Advanced wastewater treatment multi-tank system** (>> page 9)

Wastewater solutions for:

e.g. holiday homes



- **Advanced wastewater treatment multi-tank system** (>> page 9)
- **Septic tank** (>> page 15)
- **Anaerobix** (>> page 15)

The Benefits of injection moulding systems

Plastic – clear advantages

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. Plastic tanks, have smooth inner surfaces that will not corrode.

Sustainability starts with production

GRAF products help to protect the environment, so it goes without saying that they are also manufactured in an environmentally friendly way. Injection-moulding a plastic part usually requires up to 2.7 kilowatt

hours of electricity per kilogram of plastic. GRAF needs just 0.38 to 0.5 kilowatt hours.

The injection moulding process therefore consumes up to **85% less energy** than normal.

The heat generated during manufacturing is processed by a modern heat recovery system and is used to heat the production and logistics buildings.

Durable products: reliable investment

Right from the product development stage, GRAF attaches great importance to durable design. Our decades of experience combined with modern production techniques guarantee that our plastic tanks last for over 50 years. GRAF offers a warranty of up to 25 years for its wastewater tanks. A 2 year warranty is offered for SBR technology. The efficiency of our wastewater treatment systems is regularly monitored by independent institutes. All products manufactured by GRAF are also 100% recyclable.

Benefits of the Carat system

The only wastewater underground tank of it's kind!

Unique manufacturing process

The GRAF Carat underground tank is unlike any other underground tank in the world. It is the largest tank of its kind to be manufactured by injection compression moulding. This technique provides the tank with unbeatable stability and ensures that each component is produced with the highest of accuracy.

Unlike other underground tanks, the wall thickness is equal in all areas of the tank. The production tolerances are kept to a minimum, resulting in a product of the highest quality, which is strong, accurate, reliable and extremely user friendly.

To manufacture the Carat range, one of the worlds largest injection moulding systems had to be developed.



The tank that turns its head for you

The GRAF Carat underground tank has a rotating tank dome. The tank dome can be aligned with the connections independently of the tank - this makes installation much easier! All installation pipes are connected using the five standard lip seals. The Carat telescopic dome shaft connects the system to the ground surface. The height of the tank can be smoothly adjusted to suit the local conditions and it can be tilted by 5°. The whole system is flush with ground level.



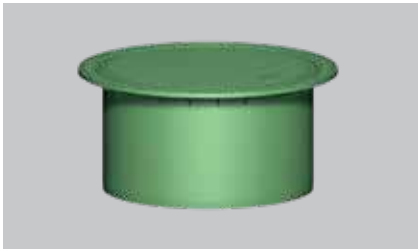
Flush with ground level

The Carat underground tank has numerous seals to efficiently stop dirt getting into the tank. This means that groundwater cannot get into the tank and, thus, dirt particles cannot contaminate the wastewater. The seals are in the intersection between the tank and the tank dome and between the tank dome and the telescopic dome shaft. All supply pipes connected to the tank dome are also sealed with five lip seals as standard.



Ribbed tank base

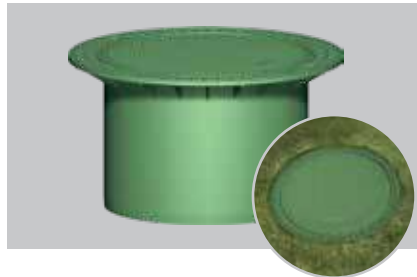
The tank base of the Carat underground tank is extremely stable thanks to the numerous ribs. These enable the Carat to be installed in groundwater up to the middle of the tank. Furthermore, the stable base means the tank is very robust for transportation to site. The tank base has already proven its excellent rigidity in numerous computer simulations during the development process. Please follow our installation instructions for this purpose (can also be downloaded at www.grafuk.co.uk).


Telescopic dome shaft Mini

- With PE cover
- Suitable for pedestrian loading
- Weight 9kg
- Adjustable earth covering across upper tank surface

plus 140mm - 340mm earth covering

Order no. 371010


Telescopic dome shaft Maxi

- With PE cover
- Suitable for pedestrian loading
- Weight 15kg
- Adjustable earth covering across upper tank surface

plus 140mm - 440mm earth covering

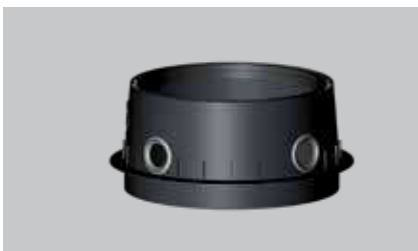
Order no. 371011


Telescopic dome shaft cast iron

- Suitable for vehicle loading - with child-proof cast iron cover up to 3.5t
- Weight 55kg
- Adjustable earth covering across upper tank surface

plus 140mm - 440mm earth covering

Order no. 371020


Tank dome Mini

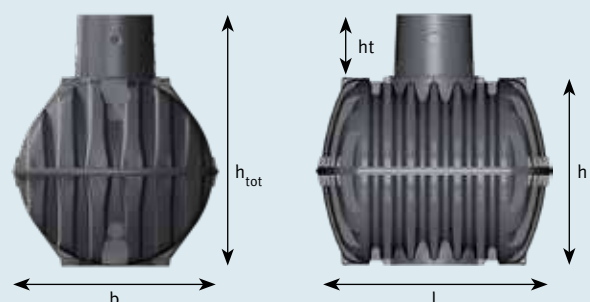
Tank dome Maxi

Tank dome Micro
Dimensions

Volume [l]	Width b [mm]	Length l [mm]	Height h [mm]	Height htot [mm]	Height of tank dome ht [mm]	Inner Ø of tank dome [mm]	Weight [kg]	Order no.
2,700 (700 US gal.)	1565 (61.6")	2080 (81.9")	1400 (55.1")	2010 (79.1")	610 (24.0")	650-800 (25.6-31.5")	120 (265 lbs.)	372028
3,750 (1,000 US gal.)	1755 (69.1")	2280 (89.8")	1590 (62.6")	2200 (86.6")	610 (24.0")	650-800 (25.6-31.5")	150 (331 lbs.)	372029
4,800 (1,250 US gal.)	1985 (78.2")	2280 (89.8")	1820 (71.6")	2430 (95.7")	610 (24.0")	650-800 (25.6-31.5")	185 (408 lbs.)	372030
6,500 (1,700 US gal.)	2190 (86.2")	2390 (94.1")	2100 (82.7")	2710 (106.7")	610 (24.0")	650-800 (25.6-31.5")	220 (485 lbs.)	372031

Technical data

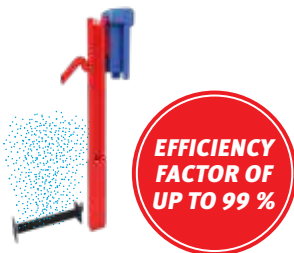
Max. earth covering (without groundwater vehicle loading)	1200 mm (47.2")
Max. vehicle weight	Suitable for vehicle loading (3.5 t) Higher loads on request
Earth covering required for vehicle loading	800 - 1200 mm (31.5 - 47.2")
Groundwater stability	up to middle of tank
Earth covering required for groundwater stability	800 - 1000 mm (31.5 - 39.4")
Connection	DN 100 / DN 150 / DN 200 on top



The one2clean system

The only wastewater underground tank of it's kind!

- ✓ Only one tank with just one chamber required
- ✓ Less energy consumption and less wear
- ✓ No mechanical elements in the wastewater
- ✓ No pumps in the wastewater
- ✓ No electrical components in the wastewater
- ✓ Incredibly low volume of sewage sludge



one2clean set-up kit

- Conventional wastewater treatment systems require up to three pumping processes. one2clean only requires one pumping process, which saves energy and extends the lifetime of the air compressor – the core part of the system
- Rugged clear water lifter manufactured in one seamless piece. No connectors or screws necessary
- Simple maintenance via an integrated, self-cleaning sampling container

one2clean system control

- The one2clean has a compact controller
- The microprocessor control system ensures simple operation and maintenance

Wastewater tank

- Telescopic cover
- State-of-the-art manufacturing for maximum stability
- Suitable for vehicle loading in conjunction with telescopic vehicle dome shaft
- 100% watertight and corrosion-resistant
- Can be installed in groundwater up to the middle of the tank

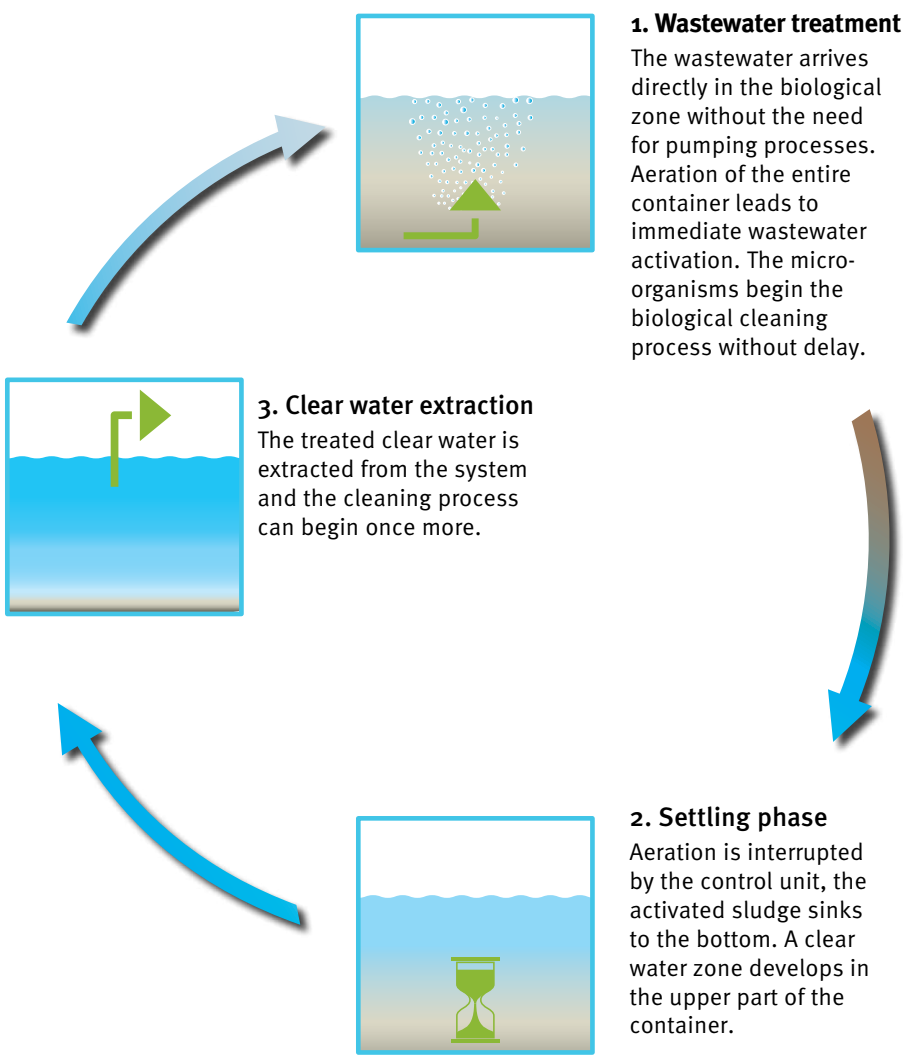
Technical data

System	one2clean
System conformity	EN 12566-3
Purifying technology	fully biological SBR lifting technology
One-tank systems available up to	9 inhabitants 1,350 l/d
Two-tank systems available up to	18 inhabitants 2,700 l/d
Maintenance interval	1 – 2 per year
Warranty for underground tank	10 years
Warranty for purifying technology	2 years
Cleaning performance	7, 14, 0.5
Control	
Holiday mode	Manual
+D Removal of nitrogen	●
+C Carbon infeed	○
Logbook function	●
Operation	4 keys
External control cabinet for installing control unit outdoors	○
Annual power consumption	230 kWh (5 inhabitants 750 l/d)

Parameter	%	mg/l
COD (chemical oxygen demand)	94.2%	43
BOD ₅ (biochemical oxygen demand)	98.0%	7
SS (suspended solids)	96.3%	14
NH ₄ -N	98.3%	0.5
N _{total}	87.0%	7.9

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

- Standard equipment
- Available as options
- not available



1. Wastewater treatment

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.

3. Clear water extraction

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

Incredibly low volume of sewage sludge

- Aeration of the entire wastewater tank
- Immediate wastewater activation
- Minimisation of the sludge
- Less sludge removal
- Cost savings

Conventional wastewater treatment systems



one2clean



Minimum maintenance costs

- Simple construction
- High-quality components
- As much technology as necessary, as little technology as possible.
- Integrated sampling point

Minimum power consumption

- one2clean has only one pumping process, reducing energy consumption and running costs
- Economical motor valve
- Energy-optimised membrane compressor

one2clean only needs 3 steps to produce clear water

The wastewater treatment is carried out in one chamber in just one tank. This eliminates unnecessary pumping processes and sludge return.

one2clean is odourless

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

one2clean already meets the needs of tomorrow

one2clean achieves sustainable discharge values with an efficiency factor of up to 99%! This offers high investment security – even if legal requirements become stricter.

One-tank system

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

Two-tank system

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

one2clean accessories

GRAF EPP control cabinet - Easy, flexible application

- Easy access for maintenance
- Function checking is simple as the control unit is located immediately next to the system
- Ideal solution for large distances from the house (>20m)
- Flexible use of the proven GRAF EPP control cabinet in a plastic external column
- Lockable housing in sturdy, weather-resistant plastic
- Integrated double power socket for easy maintenance



GRAF Plastics external control cabinet S for EP control cabinet (size upto 7 inhabitants)



GRAF Plastics external control cabinet M for EP control cabinet (size upto 18 inhabitants)

Carbonator (Carbon dosage)

Sewage treatment plants require a constant inflow of wastewater into the tank in order for them to work correctly. The seasonal occupation of holiday homes is a challenge for wastewater treatment systems that rely on constant inflow to keep the microorganism population stable. Any destabilisation of the microorganisms within the system incurs extra operating costs.

The Carbonator was especially designed to keep wastewater treatment systems with seasonal inflow stable and working correctly. The additional Carbonator module automatically feeds the

systems with nutrients that keep the microorganisms alive when there is no wastewater inflow.

Benefits

- Regardless of system - suitable for other treatment plants (one2clean compatible)
- Individual adjustment of dosage
- Low power consumption
- Fast installation
- Simple operation

Empty pipe seal DN 100

- Air-tight seal for empty pipe
- No insulating foam required
- Clean, professional solution



Minimum power consumption

- one2clean has only one pumping process, reducing energy consumption and running costs
- Economical motor valve
- Energy-optimised membrane compressor



Only 46 kWh per person and per year!

*Based on a 5PE One2Clean plant

- ✓ No live electrical parts in the water
- ✓ Low power consumption
- ✓ Optional automatic adjustment to living situation (underload detection)
- ✓ Optional remote monitoring
- ✓ High-quality components mean low maintenance costs



Advanced wastewater treatment systems

Super-quiet control cabinet

- Extremely low noise thanks to EPP housing and very quiet air compressor
- Battery-free power failure detection
- Very easy installation
- Interchangeable plug-in components

High-tech installation kit

- Integrated self-cleaning sampling container
- Each lifter manufactured as a single piece. No connectors or screws necessary
- Colour-coded and pre-assembled
- Special lifter design prevents sludge from leaking in
- Lifters easy to remove for maintenance without the use of tools

Wastewater tank

- Telescopic cover
- State-of-the-art manufacturing for maximum stability
- Suitable for vehicle loading in conjunction with telescopic vehicle dome shaft
- 100% watertight and corrosion-resistant
- Can be installed in groundwater up to the middle of the tank

Technical data

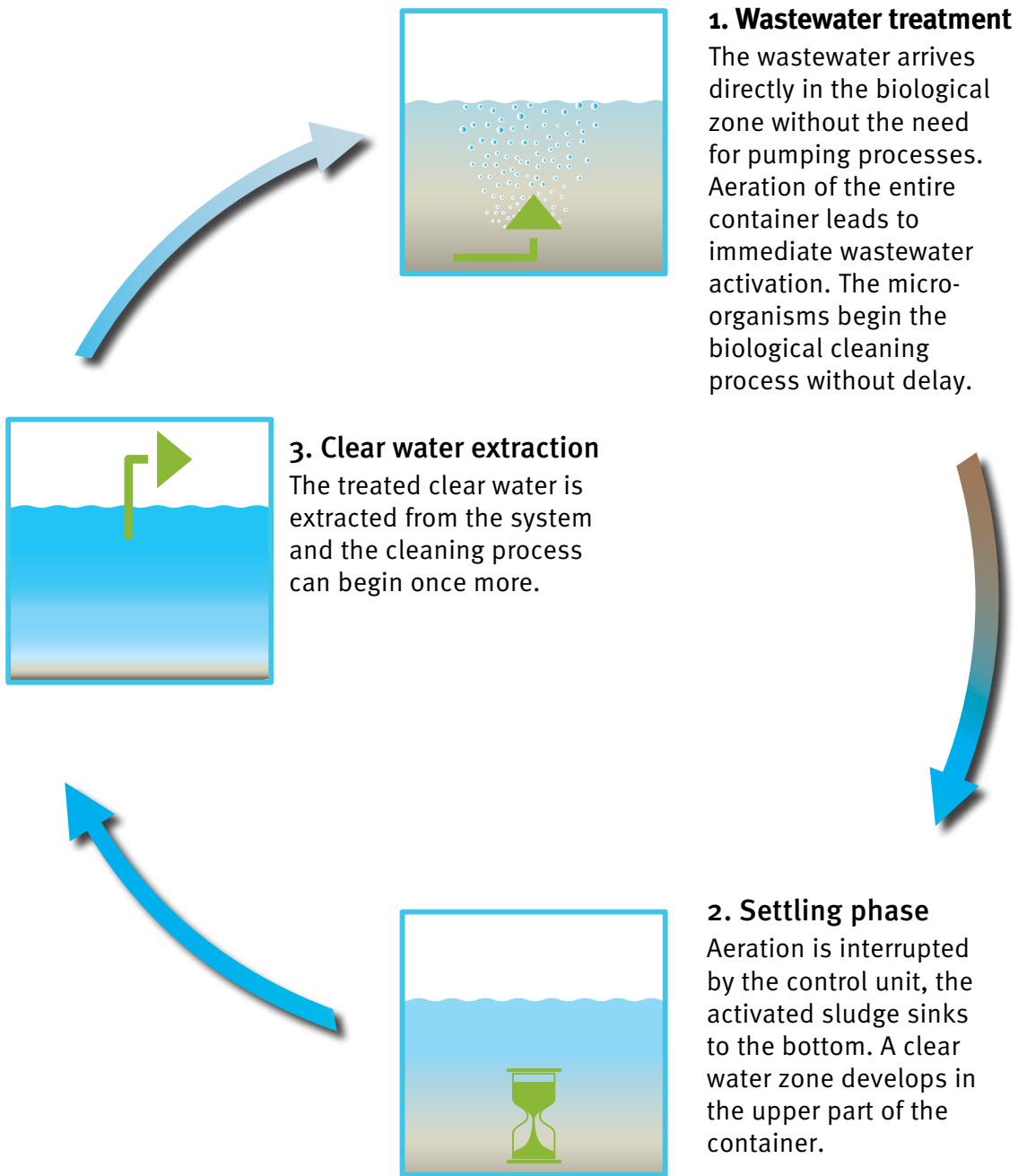
System	Advanced WWT Systems
System conformity	EN 12566-3
Purifying technology	fully biological SBR lifting technology
One-tank systems available up to	9 inhabitants 1,350 l/d
Maintenance interval	1 – 2 per year
Warranty for underground tank	10 years
Warranty for purifying technology	2 years
Cleaning performance	7, 14, 0.5 (5-18PE) / 12, 20, 12 (22-50PE)
Control	KL24plus (+K)
Holiday / economy mode (underload detection)	Automatic
Back pressure monitoring	●
+R Remote transmission (GSM modem)	○
+P Phosphate removal	○
+C Carbon infeed	○
+H Hygiene package (Disinfection)	○
+D Removal of nitrogen	○
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	○

Parameter	%	mg/l
COD (chemical oxygen demand)	94.2 / 91.9%	43/51
BOD ₅ (biochemical oxygen demand)	98.0/95.9%	7/12
SS (suspended solids)	96.3/94.4%	14/20
NH ₄ -N	98.3/65.4%	0.5/12
N _{total}	87.0/57.1%	7.9

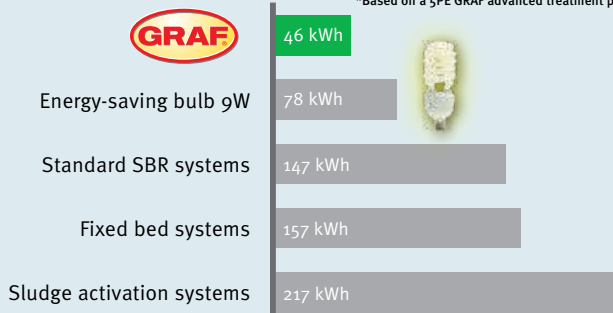
Results of practical testing undertaken by the Prüfinstitut für Abwassertechnik (Testing Institute for Wastewater Technology), Aachen

- Standard equipment
- Available as options
- not available

Advanced wastewater treatment systems



*Based on a 5PE GRAF advanced treatment plant



Minimal power consumption per inhabitant¹⁾

¹⁾The diagram indicates the annual power consumption of various wastewater treatment systems. Source: "wwt", edition 6/2007 "The wastewater treatment system as a permanent solution", page 15, table 3, practical data; One2Clean: test report by PIA (Prüfinstitut für Abwassertechnik GmbH, Testing Institute for Wastewater Technology), Aachen, test number PIA2014-216B14.01.e



Advanced wastewater treatment one-tank systems

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

Advanced wastewater treatment multitank system

Inhabitants [max.]	Max. daily flow [l/d]	Max. organic load [kg BOD ₅ /d]	Total volume [l]	Volume [l]	Length* [mm]	Width* [mm]	Height [mm]	Weight [kg]
10	1,500	0.6	7,500	2 x 3,750	5160	1755	1880	300
14	2,100	0.84	9,600	2 x 4,800	5160	1985	2110	370
18	2,700	1.08	13,000	2 x 6,500	5380	2190	2390	440
22	3,300	1.68	9,600	2 x 4,800	5160	1985	2250-2450	440
28	4,200	1.92	13,000	2 x 6,500	5380	2190	2530-2730	530
35	5,250	2.10	17,000	2 x 8,500	15500	2040	2515-2715	780
40	6,000	2.40	20,000	2x10,000	15500	2240	2715-2915	930
50	7,500	3.00	26,000	4x 6,500	11360	2190	2850-3050	1060
60	9,000	3.60	26,000	4x 6,500	11360	2190	2850-3050	1060

Advanced wastewater treatment system accessories

Plastic external control cabinet M

for up to 18 inhabitants
Order no. 107773



Plastic external control cabinet L

for up to 22-40 inhabitants



Benefits

- Easy access for maintenance
- 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 a plastic external column
- Lockable housing in sturdy, weather-resistant plastic
- Integrated double power socket for easy maintenance

Easy, flexible application for the GRAF EPP control cabinet M



EPP control cabinet
Part of the wastewater treatment system



GRAF Plastics external control M cabinet for EP control cabinet (size up to 18 inhabitants)



+K Convenience package

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

Standard

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

+O Outlet with clear water pump

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

On request



+D Removal of nitrogen

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

Order no. 107520

+P Phosphate removal package

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

On request



+C Carbon infeed

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

+R Remote transmission

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 control by GSM 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

Order no. 107117



+H Hygiene package

Disinfection using the +H package satisfies even the most stringent of purity requirements for a GRAF wastewater treatment system. Without the use of chemical substances, 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



Accessories for small wastewater treatment systems

Sampling point, internal

For two- and multitank systems

Order no. 107170

Empty pipe seal DN 100

- Air-tight seal for empty pipe
- No insulating foam required
- Clean, professional solution

Order no. 107613



Filling granulate for external cabinets

Prevents soil moisture from rising into the external control cabinet. Required amount: 1 bag per external control cabinet for 12 – 28 inhabitants; 50 l bag

Order no. 107607

Voltage transformer

- From 110 V – 230 V
- Up to 300 W (LA 200)

Order no. 107421

Odour filter

For DN 100 ventilation openings; reliably filters out unpleasant odours; filter insert of multi-layer mesh with impregnated activated carbon

Order no. 104018



Filter insert

For odour filter; replace at least every two years or when odour is perceptible

Order no. 104024



SBR hose package (Advanced)

Includes:

1 x Ø 19 mm and 3 x Ø 13 mm PVC hose; colour-coded for Advanced WWT system

Length: 20 m

Order no. 107192

SBR hose package (One2Clean)

Includes:

1 x Ø 19 mm and 1 x Ø 13 mm PVC hose; colour-coded for One2Clean system

Length: 20 m

Order no. 107668

Large advanced wastewater treatment systems

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.



Options

+D +P +C +H +R

The proven options of the advanced wastewater treatment systems are also available on request for large systems.



Inhab. [max.]	Max. daily flow [l/d]	Max. organic load [kg BOD ₅ /d]	Volume [litres]	Length [mm]	Width [mm]	Product code
75	12,250	3.60	2X 16,000	9900	2500	G50036
90	13,500	5.40	2X 22,000	12900	2500	G50038
100	15,000	7.20	2X 22,000	12900	2500	G50040
150	22,500	9.00	2X 32,000	17700	2500	G50042
200	30,000	10.80	4X 22,000	26400	2500	G50044
250	45,000	15.00	1X 52,000 2X 32,000	13300	8700	G50046
300	45,000	18.00	1X 52,000 2X 32,000	13300	8700	G50048
350	52,500	21.00	3X 22,000 2X 38,000	19900	5600	G50050
400	60,000	24.00	3X 22,000 2X 44,000	21400	5600	G50052
450/500	75,000	27.00/30.00	3X 22,000 4X 32,000	27500	5600	G50054
550/600	90,000	33.00/36.00	3X 26,000 4X 32,000	16200	11800	G50056
650/700	105,000	39.00/42.00	2X 32,000 4X 38,000 1X 38,000	27500	5600	G50058
750/800	120,000	45.00/48.00	3X 22,000 6X 28,000 1X 54,000	26200	8700	G50060
850/900	135,000	51.00/54.00	3X 22,000 6X 34,000 1X 54,000	29100	8700	G50062
950/1000	150,000	57.00/60.00	3X 22,000 6X 38,000	30500	8700	G50064

External control cabinets



L metal external cabinet



XL metal external cabinet



Concrete external cabinet

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

Carat Septic Tank

Two chambers

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

Benefits

- Low weight: can also be installed in difficult local conditions without a crane
- Low maintenance: maintenance or cleaning work can be performed through the shafts
- Tanks can be used as rainwater harvesting systems after thorough cleaning

12566-1*

Hydraulic efficiency **99.9%**

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



Carat S Septic tank

Inhabitants [max]	Total volume [l]	Capacity [l]	Length [mm]	Width [mm]	Height [mm]	Weight [kg]
4	2,700	2,700	2080	1565	2010	145
11	3,750	3,750	2280	1755	2200	175
18	4,800	4,800	2280	1985	2430	220
30	6,500	6,500	2390	2190	2710	260

One complete system consists of: Carat underground tank with baffle. Also available without baffle as a one-chamber wastewater tank.

Anaerobix – Wastewater Treatment System with Biological Filter

Simple and low-cost

- Anaerobix is the new low-cost anaerobic filter system for wastewater tanks in Graf 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.

The benefits of the Anaerobix system at a glance

- Very good cleaning performance: efficiency over 90%, PIA-certified (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



Technical data

System	Anaerobix
Purifying technology	Anaerobic system
One-tank systems available up to	3,750 l/d
Maintenance interval	1 – 2 per year
Warranty for underground tank	10 years

Anaerobix single-tank system

Tank volume	2,700 litres	3,750 litres	4,800 litres	6,500 litres
Max. daily flow [l]	1,200	2,250	2,850	3,750



Limit values

BOD ₅ (biochemical oxygen demand)	75 %
SS (suspended solids)	90 %



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.

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

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

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

RAINWATER HARVESTING



INFILTRATION



WASTEWATER TREATMENT SOLUTIONS



MULTIPURPOSE CONTAINERS



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Graf Ireland
Milltown Business Park
Milltown
Co. Galway

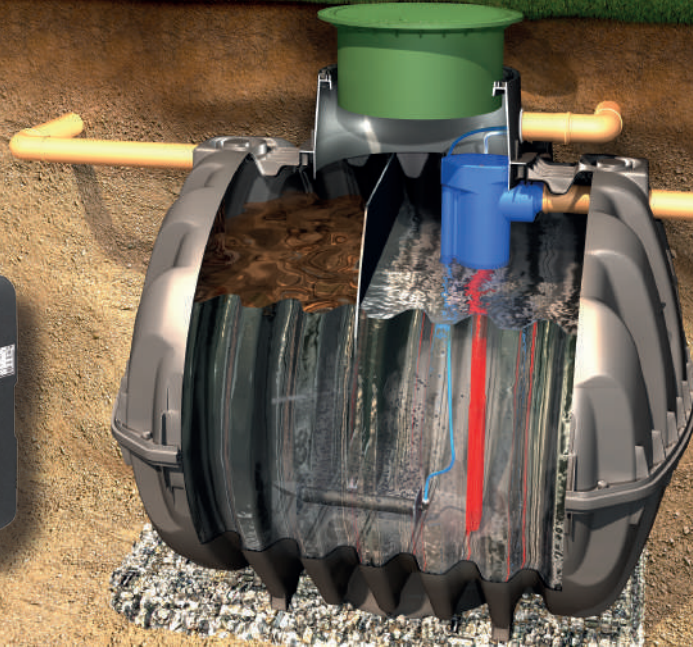
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F: +44 1295 211333
E: info@grafireland.ie
www.grafireland.ie

Your expert specialist dealer:

GRAF Advanced Wastewater Treatment System



COMPRESSOR & CONTROL PANEL



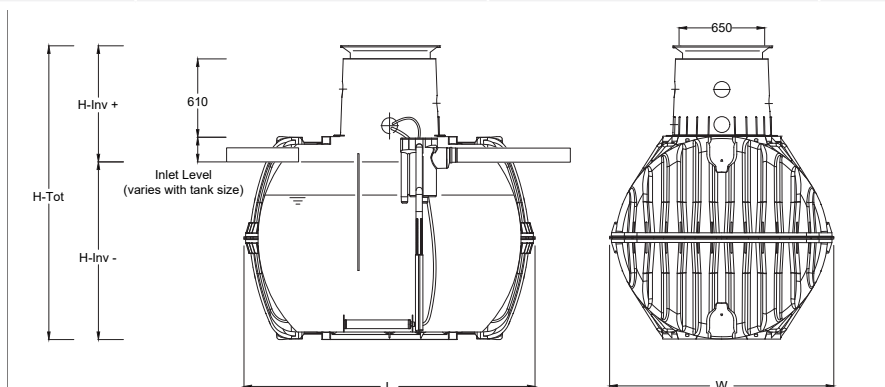
Advanced wastewater treatment system

- Telescopic manhole cover, offers variable invert levels
- Low power consumption
- Self anchoring tank
- No concrete backfill required
- No electrical components inside the tank
- High treatment performance
- Long sludge storage period
- Integrated sampling chamber inside the tank

Scope of supply

- 1 GRAF advanced wastewater tank with diffusers, air lifter for clear water extraction and intergrated sampling chamber
- 2 Telescopic manhole cover, suitable for either pedestrian or vehicle loading
- 3 2 number 20m SBR hoses, 19mm used for aeration and 13mm for clear water extraction
- 4 GRAF advanced wastewater treatment control unit with compressor
- 5 Optional EPP external housing cabinet for control panel and compressor

Population Equivalent	5 PE	7 PE	9 PE
Tank	3750 litres	4800 litres	6500 litres
Max. Daily inflow	750 l/d	1050 l/d	1350 l/d
Weight with mini tank dome	146kg	181kg	220kg
Weight with maxi tank dome	150kg	185kg	220kg
L	2280mm	2280mm	2390mm
W	1755mm	1985mm	2190mm
H-Inv -	1,370mm	1,600mm	1,840mm
H-Inv +	950 to 1460mm		
H-Tot	2200 to 2790mm	2250 to 3020mm	2530 to 3300mm



How the system works

Untreated waste enters the tank via the inlet on the side of the tank. The wastewater falls directly into the biological zone where the treatment is taking place, this allows the micro-organisms to start the breakdown process without delay.

Compressed air is sent to the treatment plant via the control panel. This air is initially used for aeration through the diffuser. The aeration process is intermittent to achieve the best treatment performance. Aeration

+P Phosphate Removal Package - When would you need it?

Depending on where you live and what watercourse your system is discharging to, your local environment agency may require your wastewater treatment plant to be able to remove phosphates from the effluent.

This is required as too many phosphates can cause irreversible changes to an Eco-system by increasing production of algae, depleting fish stocks and deteriorating the water quality in general. Many UK watercourses have previously had high numbers of untreated septic tanks & treatment plants feed in to them, with no mitigation of the phosphates, and so are now at a critical point where no further untreated

is then stopped to allow for the waste to sink to the bottom of the tank.

Compressed air is then sent to the plant again to extract the cleaned water near the surface, via the red air-lift. This water passes through a sampling chamber before leaving the plant, where samples can be taken to confirm the quality of the effluent. The above process occurs twice per day, each lasting 12 hours.

domestic wastewater can be allowed to enter.

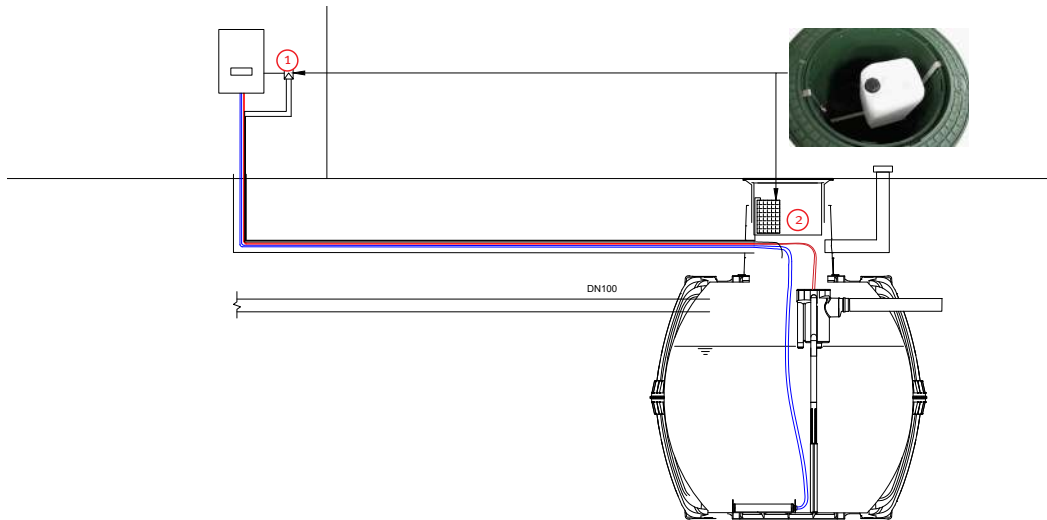
Our system works by adding a polyaluminium chloride solution in to the tank, which is carefully dosed to the correct amounts depending on your system size. This chemical essentially reacts with the phosphates and effectively lowers the levels. The Graf system has been tested independently, and can achieve a market leading phosphate level as low as 0.4 mg/l in the final effluent.

It is important the PAC solution is regularly checked and replaced as necessary to ensure these low levels are maintained

+P Phosphate Removal Package - How does it work?

Systems delivered with the phosphate removal package come with the necessary peristaltic pump in the cabinet. The pump has a suction hose and delivery hose which takes solution from a canister and doses this to the treatment plant. The runtime of the dosing pump is determined by the time set for the pump in the service menu of the treatment plant control panel. The amount of precipitant added is therefore dependent on the set time. The large Compact pump has a potentiometer for

setting delivery rate. In order to start up the precipitant device, the precipitant container must be placed in a frost-proof location. The intake and delivery hoses should also be laid in frost-free areas. The delivery hose is to be routed into the SBR reactor and placed inside the reactor with the outlet located above the reactor basin, ensuring that the precipitant flows directly into the wastewater to be treated and does not dampen any components.



- ① The control panel is preset to dose the required amount of solution, based on the system's requirements

- ② The precipitant solution is housed in a container in the dome of the tank. The dosing pump draws the solution via a small hose before depositing it back into the SBR reactor. Maxi dome required if canister is located in turret on tank

The +P package provides precipitant dosing for the reduction of phosphates in the effluent, which would otherwise damage the environment.

12566-7 by the notified body PIA GmbH. The systems are additional stages of treatment for Graf wastewater treatment systems, which are fitted with a KL24plus or KLplus control unit.

This system is tested and certified according to EN

For further information please call us on 01608 661500 or visit our website www.grafuk.co.uk





INSTALLATION MANUAL

ONE2CLEAN TANKS



Safety

The relevant accident prevention regulations must be observed during all work. Particularly when walking on the tanks, a 2nd person is required to secure the tank.

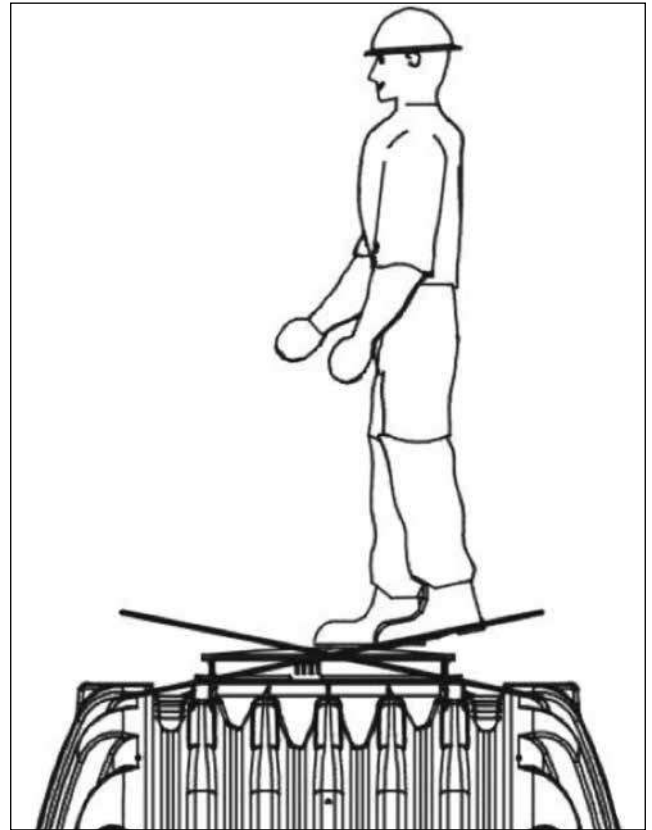
The relevant regulations and standards must additionally be taken into consideration during installation, assembly, servicing, repair, etc.

The system or individual parts of the system must be installed by qualified specialists.

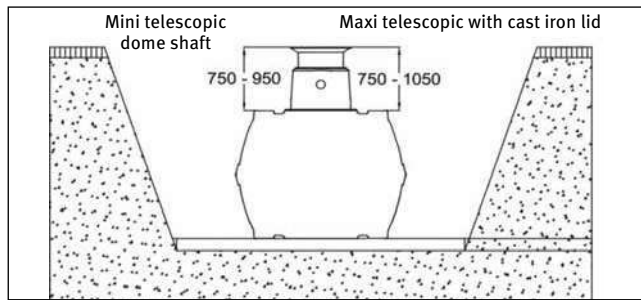
During all work on the system or parts of the system, the entire system must always be rendered inoperable and secured to prevent unauthorised reactivation. Except in the event of work carried out in the tank, the cover of the tank must always be kept sealed, as this otherwise constitutes a maximum risk of accident. Only original GRAF covers or covers approved in writing by GRAF must be used.

GRAF offers an extensive range of accessories, all of which are designed to match each other and which can be extended to form complete systems.

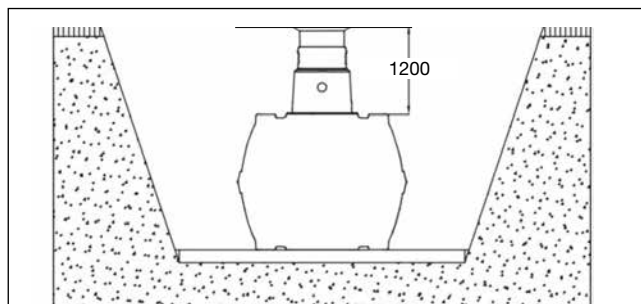
The use of other accessories may lead to impediments to the system's functional capability, therefore invalidating liability for resulting damage.



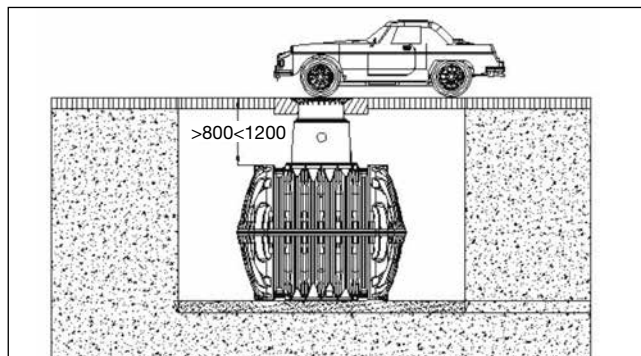
Coverage heights with telescopic dome shaft in green areas.



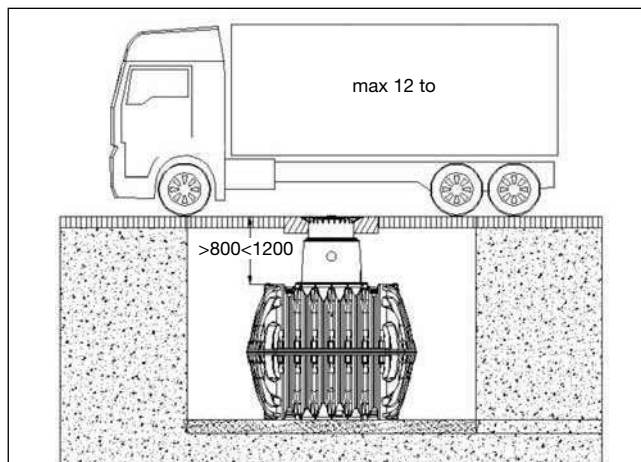
Maximum coverage heights with extensions and telescopic dome shaft.



Covering heights with cast telescopic dome shaft (with class B cast cover) in areas with car traffic (load up to 3.5 t).

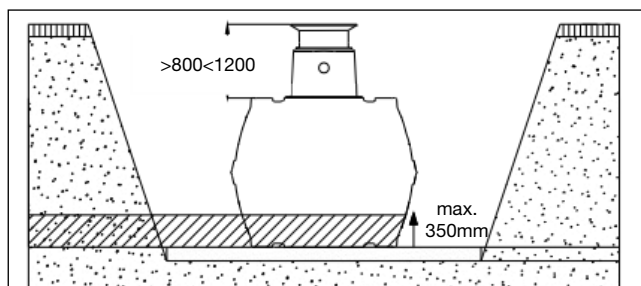


Coverage heights with vehicle loading cover (suitable cover to be provided by others) in areas used by trucks with a max. weight of 12 t.

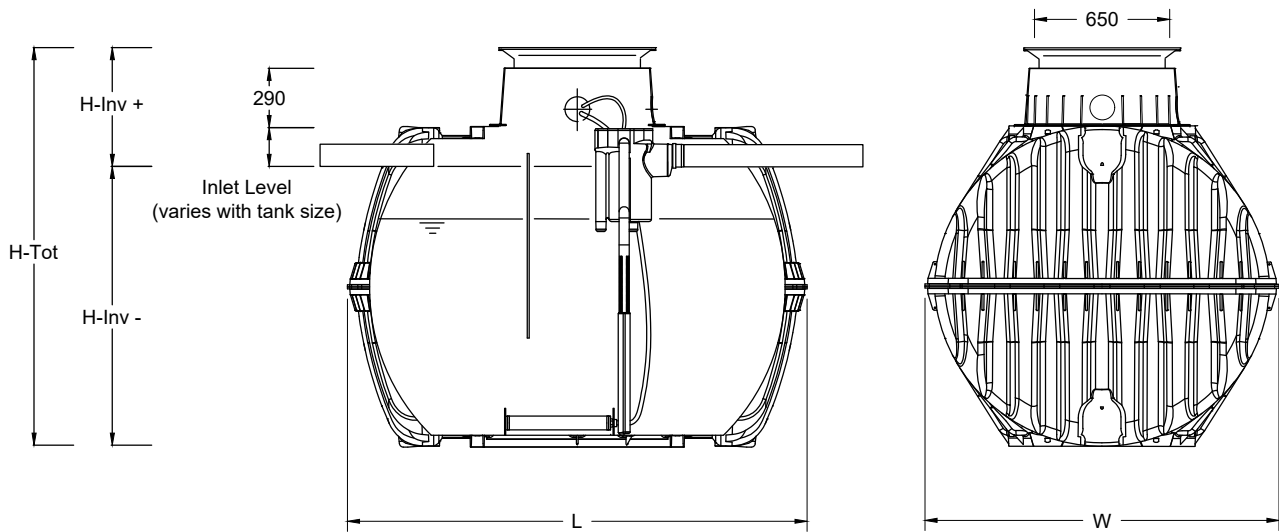


Coverage heights on installation in groundwater the hatched area specifies the permissible immersion depth for the tanks.

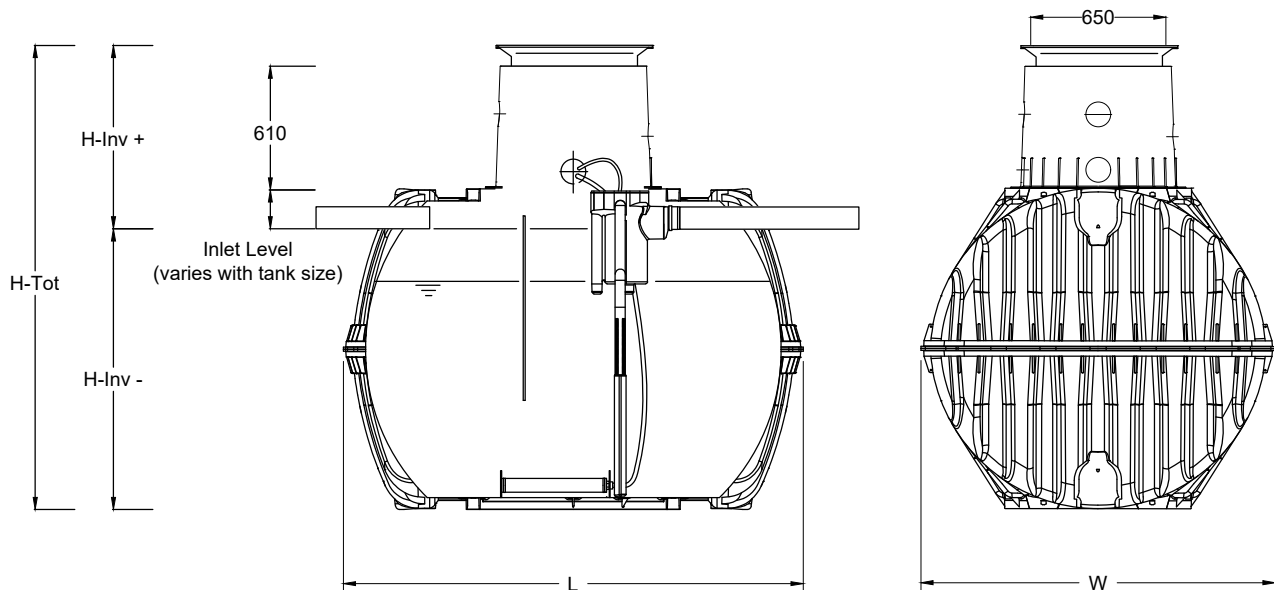
The immersion depth is 350 mm.



With mini tank dome



With maxi tank dome

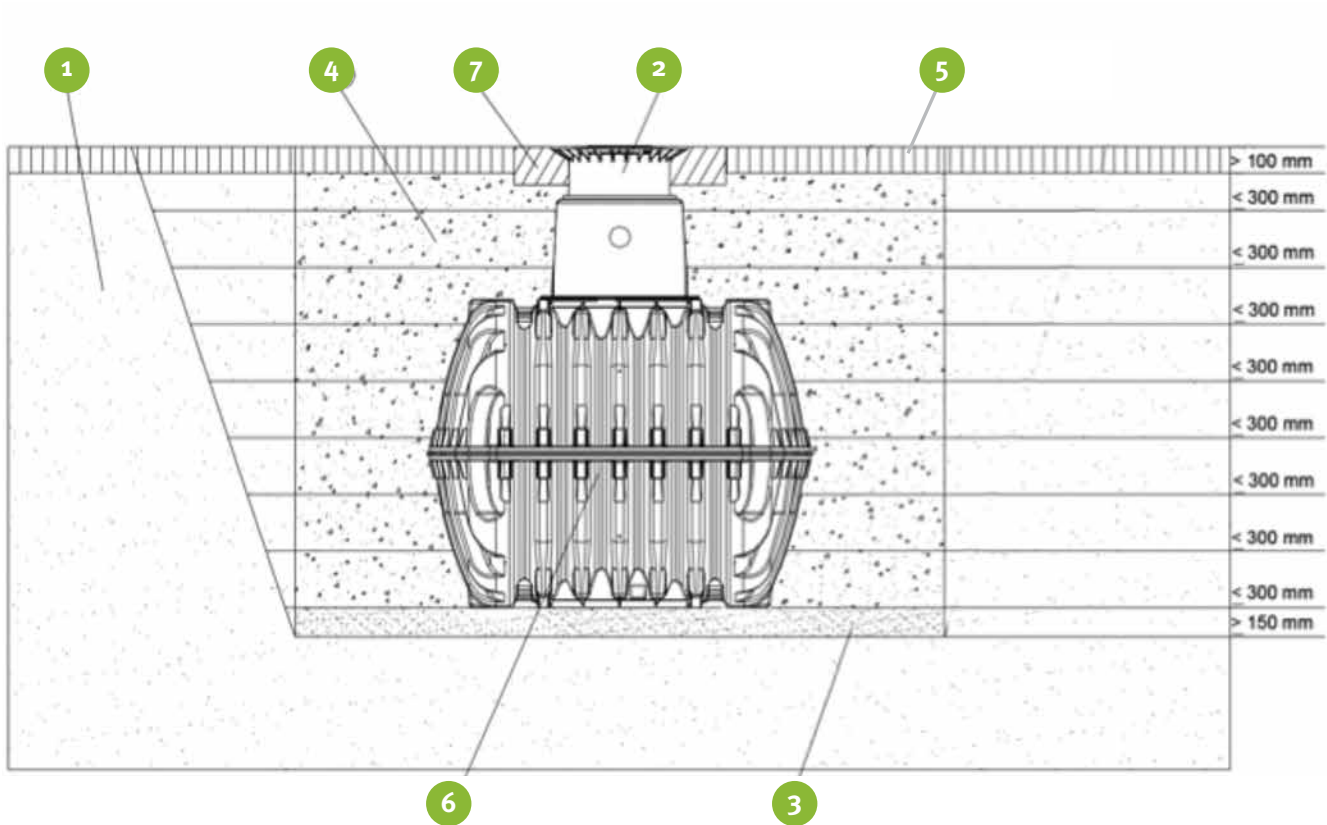


* Various inlet options available to suit installation. Please specify invert depth required when ordering.

Population Equivalent	5 PE	7 PE	9 PE
Tank	3750 litres	4800 litres	6500 litres
Max. daily inflow	750 l/d	1050 l/d	1350 l/d
Weight with mini tank dome	146kg	181kg	220kg
Weight with maxi tank dome	150kg	185kg	220kg
L	2280mm	2280mm	2390mm
W	1755mm	1985 mm	2190mm
H-Inv -	1390mm	1575mm	1840mm
H-Inv + *	630 to 1460mm		
H-Tot	2020 to 2790mm	2250 to 3020mm	2530 to 3300mm

4 TANK INSTALLATION

1. Subsoil
2. Telescopic dome shaft
3. Compact foundation
4. Surrounding (round-grained gravel, maximum grain size 10 to 20mm)
5. Covering layer
6. Carat underground tank
7. Concrete layer for surfaces used by passenger cars



Trench

To ensure that sufficient space is available for working, the base area of the trench must exceed the dimensions of the tank by 500mm on each side; the distance from solid constructions must be at least 1000mm.

The trench embankment must be designed so that slippage or collapse of the embankment wall is not to be anticipated. The construction site must be horizontal and plane and must guarantee sufficient loadbearing capacity.

The depth of the trench must be dimensioned so that the max. earth coverage (see point 2 installation conditions) above the tank is not exceeded. To use the system throughout the entire year, it is necessary to install the tank and those parts of the system which conduct water in the frost-free area. The frost-free depth is usually approx. 600mm to 800mm; precise information in this regard can be obtained from the responsible authority.

A layer of compacted, round-grain gravel (grain size 10 to 20mm, thickness approx. 150 - 200mm) is applied as the foundation.

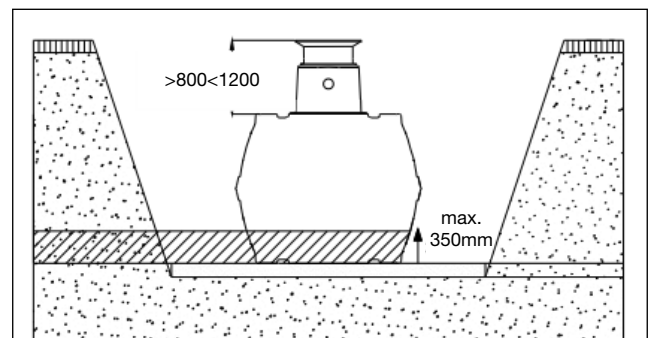
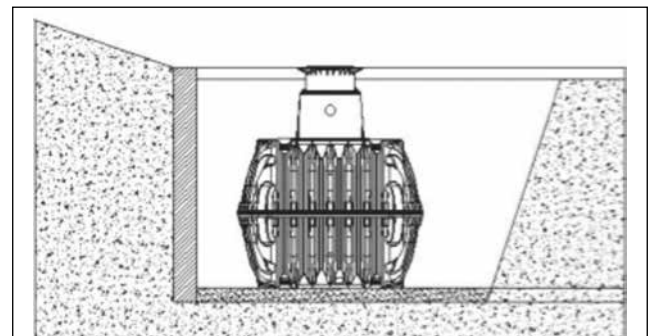
Slope, embankment, etc.

On installation of the tank in the immediate vicinity (< 5m) of a slope, earthen mound or slope, a statically calculated supporting wall must be erected to absorb the soil pressure. The wall must exceed the dimensions of the tank by at least 500mm in all directions, and must be located at least 1000mm away from the tank.

Groundwater and cohesive (water-impermeable) soils (e.g. clay soil)

If it is anticipated that the tanks will be immersed deeper into the groundwater than is shown in the adjacent figure, sufficient dissipation must be ensured. (See table for max. immersion depth).

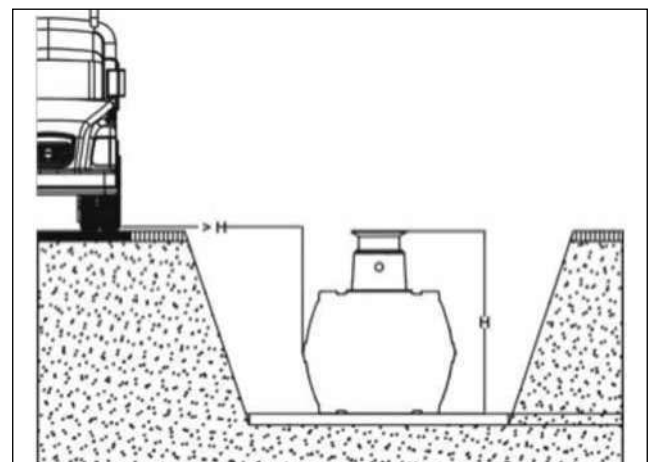
Dissipation of the drainage water (e.g. via an annular drainage system) is recommended in the case of cohesive, water-impermeable soils.



Population Equivalent	5 PE	7 PE	9 PE
Tank size	3750	4800 L	6500
Immersion depth	350mm	350mm	350mm

Installation adjacent to surfaces used by vehicles

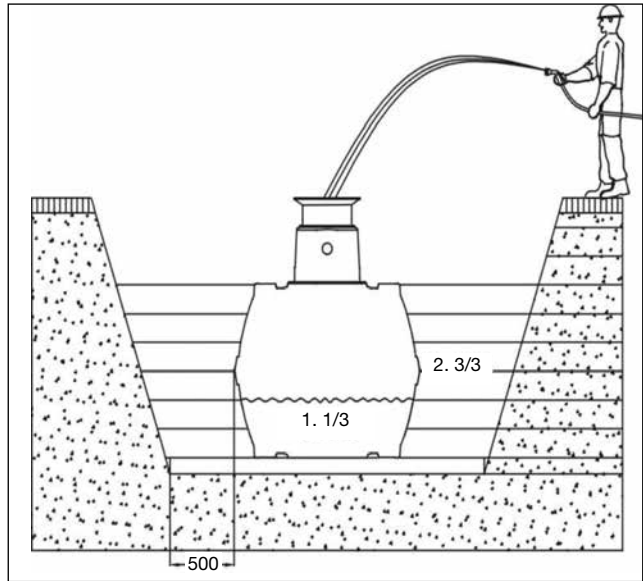
If the underground tanks are installed adjacent to surfaces which are used by vehicles heavier than passenger cars, the minimum distance away from these surfaces is at least the depth of the trench.



Insertion and filling

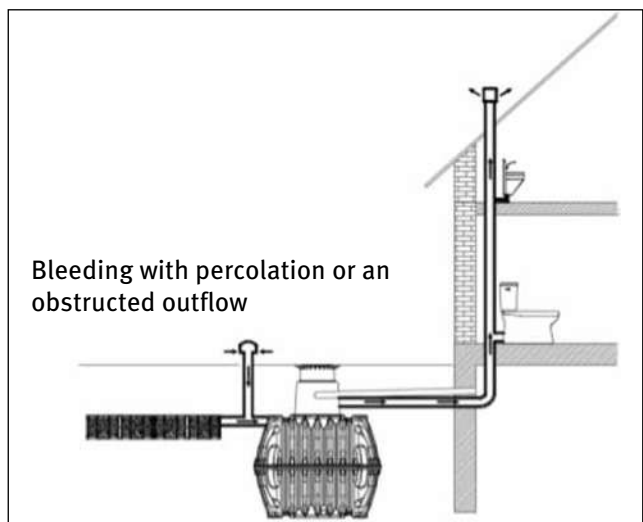
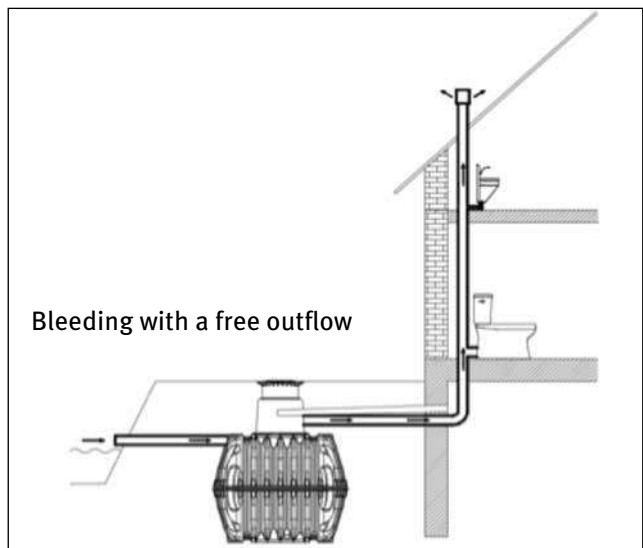
The tanks must be inserted, impact-free, into the prepared trench using suitable equipment. The tank is filled with $\frac{1}{3}$ water before starting to backfill.

Afterwards the surrounding (roundgrain gravel, max. grain size 10 to 20mm) is then filled in layers of max. 30 cm steps and is compacted. The individual layers should be manually tampered to ensure no voids. Damage to the tank must be avoided during compaction. Mechanical compaction machines must not be used under any circumstances. The surrounding must be at least 500mm wide.



Ventilation and bleeding

Poor venting and the lack of a Soil Vent Pipe is the number one cause of smells from treatment plants. All tanks must be ventilated and bled back through the soil vent pipe (chimney effect). Air Admittance Valves (Durgo Valves) must not be used instead of the SVP. These valves are fine for houses connected to mains drainage but NOT for ones with a treatment plant.



Assembling the telescopic dome shaft

The telescopic dome shaft enables infinite adaptation of the tank to given site surfaces with earth coverage of between 750mm and 950mm (Mini telescopic dome shaft) or 750mm and 1050mm (Maxi telescopic dome shaft).

For assembly purposes, the enclosed profile seal (material EPDM) is inserted into the tank dome's sealing groove and is coated generously with soft soap (do not use mineral oil-based lubricants, as these attack the seal). The telescope is then greased, inserted and aligned with the surface of the site.

Telescopic dome shaft on which persons may walk

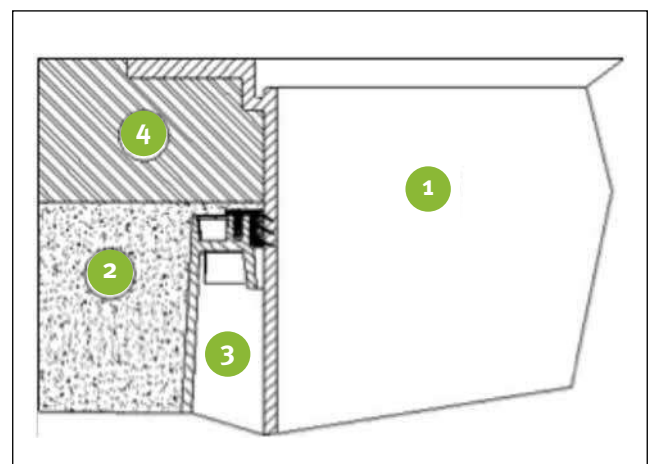
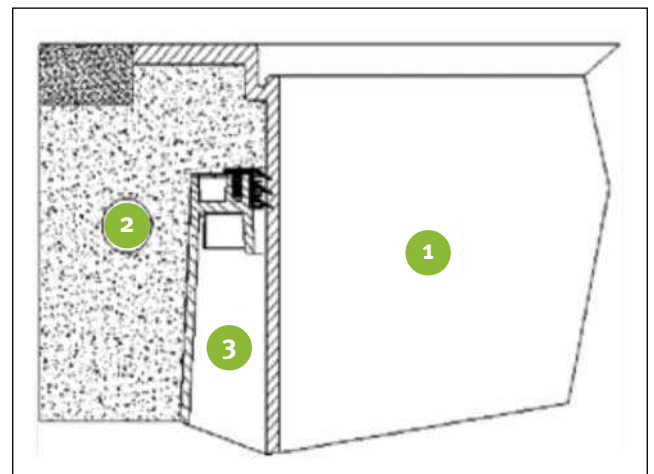
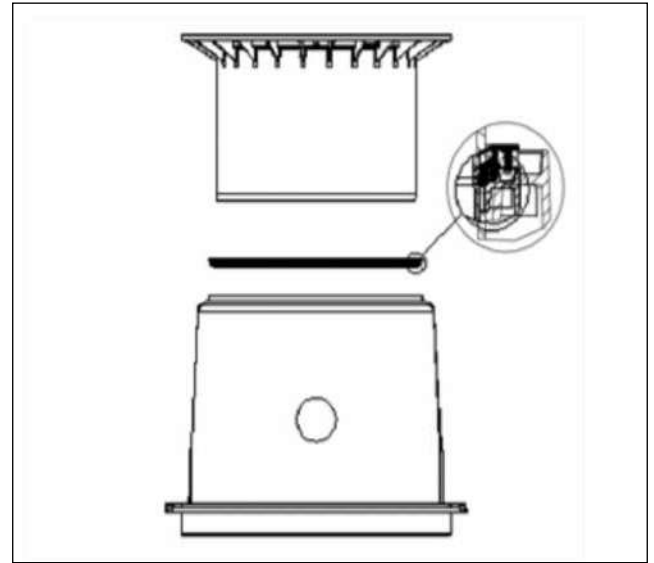
Important: To prevent loads from being transferred onto the tank, round-grain gravel ① (max. grain size 10 to 20mm) is filled in in layers around the telescope ② and is evenly compacted.

Damage to the tank dome ③ and telescope must be avoided during this step. The cover is then positioned and is sealed to prevent entry by children. **Tighten the threaded connection on the cover so tightly that it cannot be opened by a child!**

Telescopic dome shaft over which passenger cars may drive

If the tank is installed under areas used by passenger cars, the collar area of the telescope ① (colour anthracite) must be supported with concrete ④ (load class B25 = 250 kg/m²). The layer of concrete to be installed must be at least 300mm wide and approx. 200 mm high all around. The minimum coverage above the shoulder of the tank is at least 800mm (max. 1050mm with telescope, coverage up to max. 1200mm possible with intermediate section).

Attention: It is essential to use the cast telescopic dome shaft (with class B cast cover).

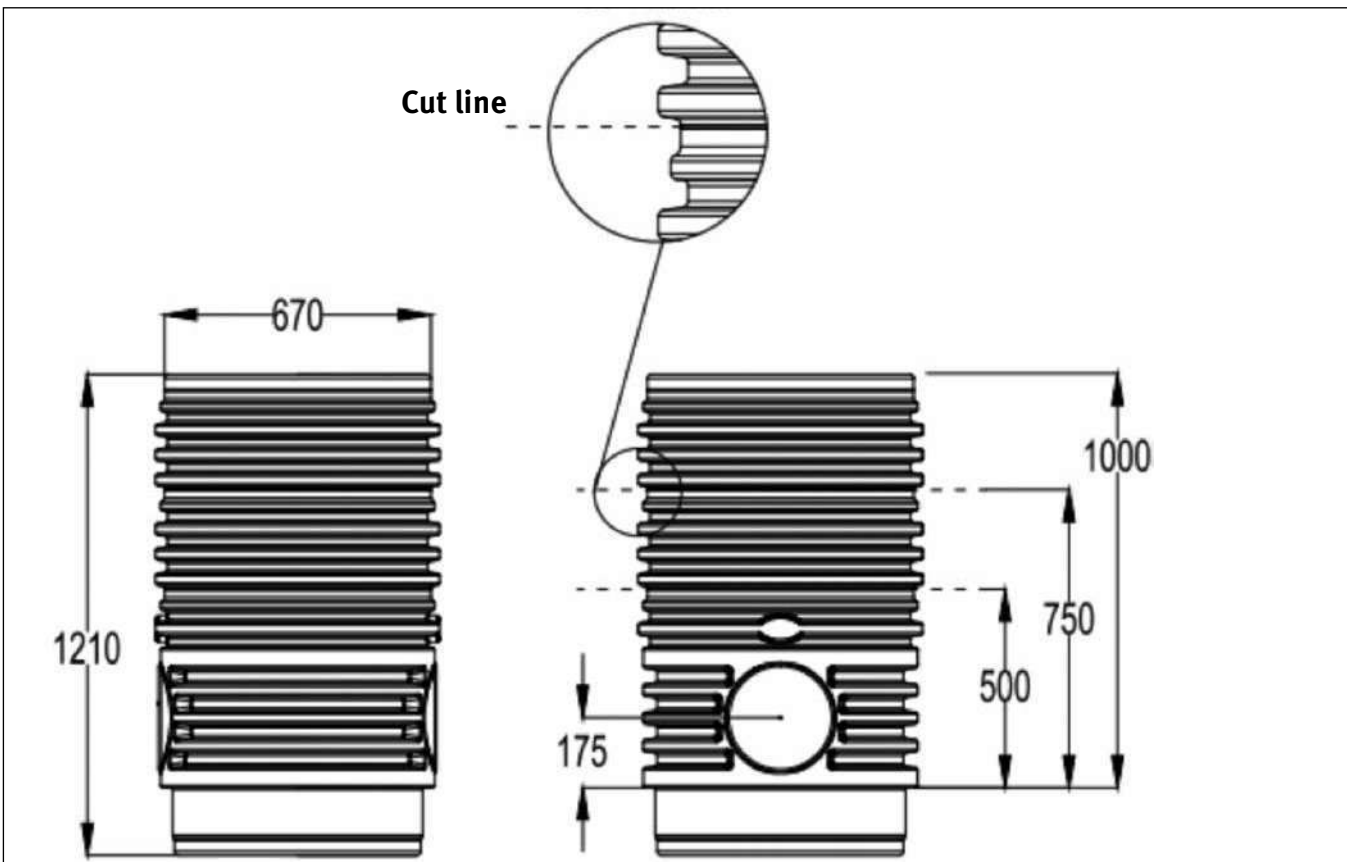
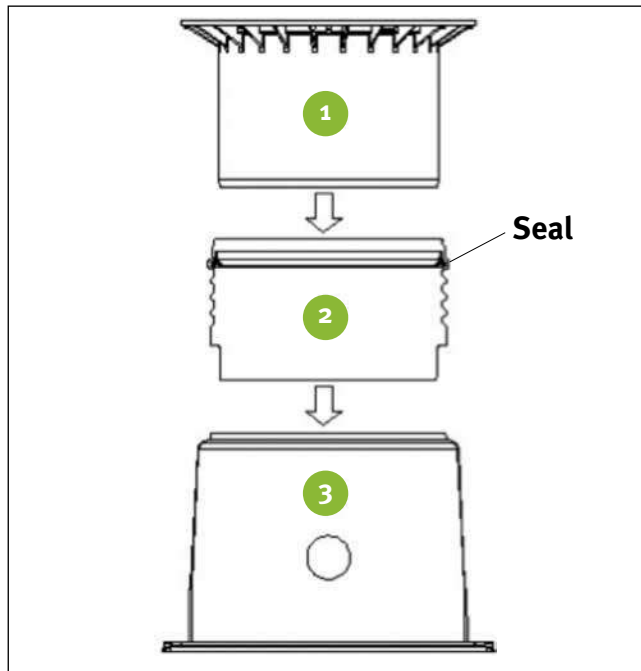


Assembling the extension

For larger coverage heights an extension is needed. To insert the extension into the tank dome, soft soap is needed. Into the highest groove of the extension the profile seal is inserted and greased generously. Afterwards push the telescopic dome shaft into the extension and adapt it to the planned area surface. The extension must not be cut down.

1 Extension = max. earth-cover 1200mm
(in each case in connection with the Maxi telescopic dome shaft)

- ① Telescopic dome shaft (can be inclined by 5°)
- ② Extension
- ③ Tank dome (can be rotated by 360°)



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NOTES:-

PO	FOR GUIDANCE	DS	07.10.20
REV	DESCRIPTION	BY	DATE
ISSUE			

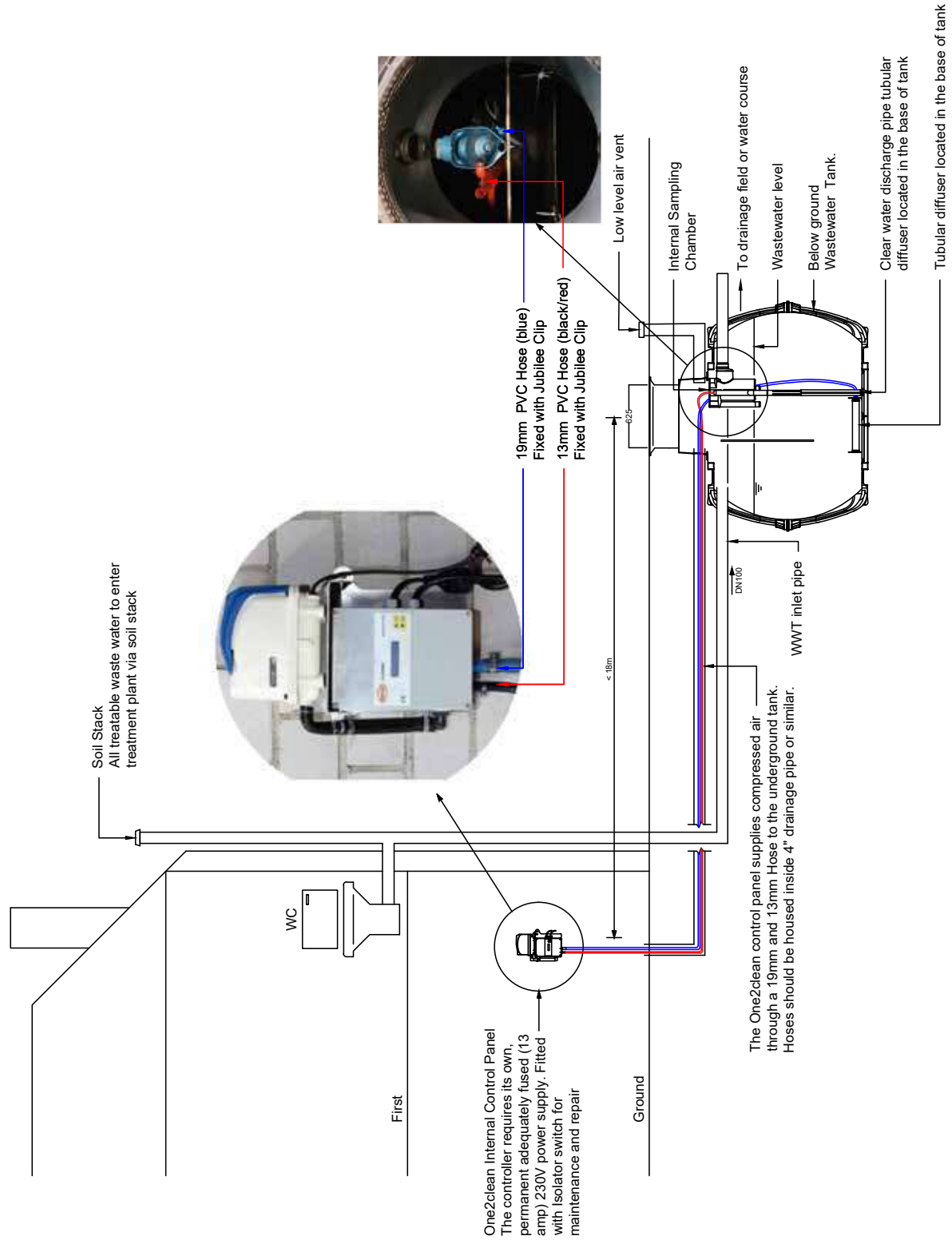
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PROJECT			

PROJECT: ONE2CLEAN

DESCRIPTION: INTERNAL CABINET

DRAWING NO.	REV.
ONE2CLEAN_INTERNAL CABINET	P0



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REV.	DESCRIPTION	BY	DATE

ISSUE

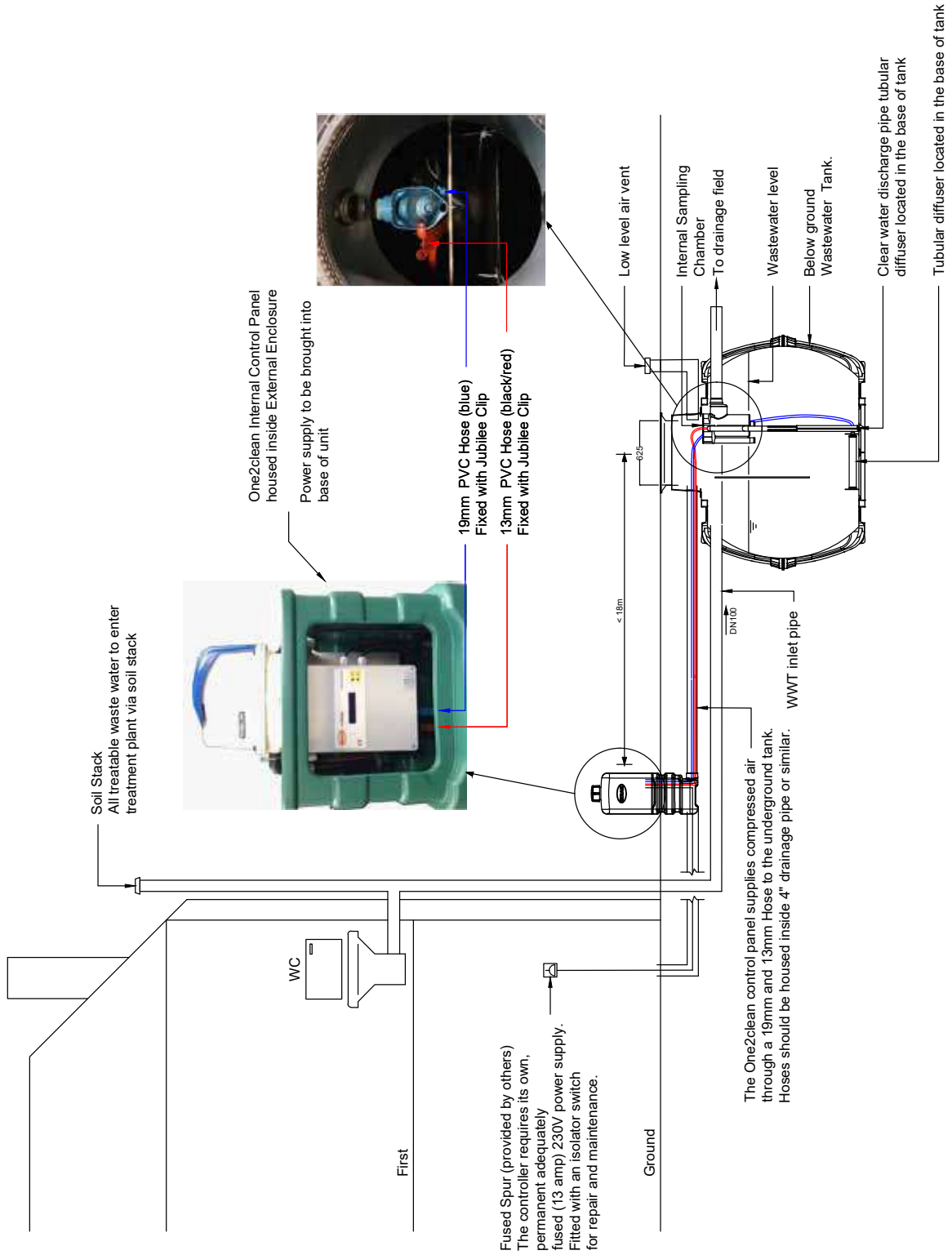


DRAWN: DS
CHECKED: MC
DATE: 07.10.20
SCALE: NTS@A3

PROJECT
ONE2CLEAN

DESCRIPTION
EXTERNAL CABINET

DRAWING NO.
ONE2CLEAN_EXTERNAL_CABINET_P0
REV.



6. EXTERNAL CABINET

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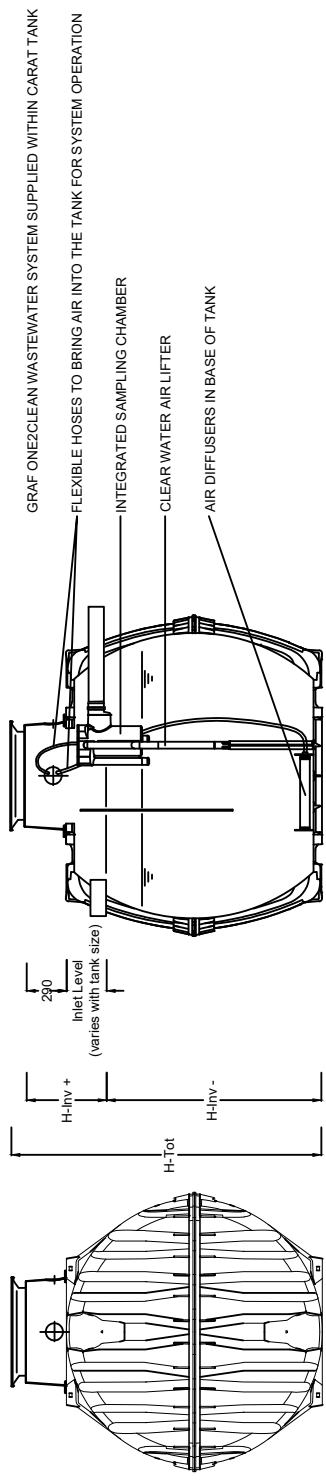
GRAF ONE2CLEAN SYSTEM OPTIONS:

- 3750 LITRE CARAT TANK - 5 PE TREATMENT PLANT
- 4800 LITRE CARAT TANK - 7 PE TREATMENT PLANT
- 6500 LITRE CARAT TANK - 9 PE TREATMENT PLANT

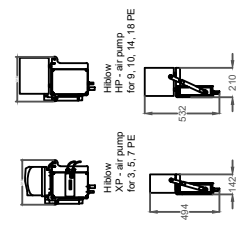
SCOPE OF SUPPLY:

- GRAF ONE2CLEAN WASTEWATER SYSTEM SUPPLIED WITHIN CARAT TANK
- AIR DIFFUSERS IN BASE OF TANK
- CLEAR WATER AIR LIFTER
- INTEGRATED SAMPLING CHAMBER
- TELESCOPIC LID, SUITABLE FOR EITHER PEDESTRIAN OR VEHICLE LOADING REQUIREMENTS
- FLEXIBLE HOSES TO BRING AIR INTO THE TANK FOR SYSTEM OPERATION
- INTERNAL SYSTEM CONTROL PANEL WITH DISPLAY AND OPERATIONAL BUTTONS TO SUPPORT COMPRESSOR

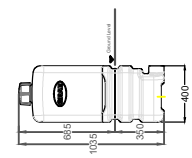
OPTIONAL:
(EPP) EXTERNAL HOUSING ENCLOSURE FOR INTERNAL SYSTEM CONTROL PANEL



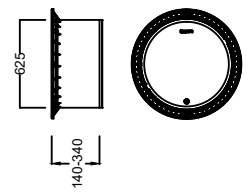
INTERNAL SYSTEM CONTROL PANEL WITH DISPLAY AND OPERATIONAL BUTTONS TO SUPPORT COMPRESSOR



(EPP) EXTERNAL HOUSING ENCLOSURE FOR INTERNAL SYSTEM CONTROL PANEL



TELESCOPIC LID, SUITABLE FOR EITHER PEDESTRIAN OR VEHICLE LOADING REQUIREMENTS



Population	3750 litres	4800 litres	6500 litres
Structure	5 Franchises	7 Franchises	7 Franchises
Weight	44kg	88kg	220kg
Length (L)	220mm	220mm	230mm
Width (W)	175mm	195mm	210mm
H-Hw -	130mm	155mm	180mm
H-Hw +	490mm	530mm	550mm
H-Tot	200-290mm	250-300mm	250-300mm

PO	FOR GUIDANCE	DS	DATE
REV	DESCRIPTION	BY	DATE

GRAF UK Limited
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 E: info@grafuk.co.uk www.grafuk.co.uk

DRAWN: DS1 DATE: 14.08.20
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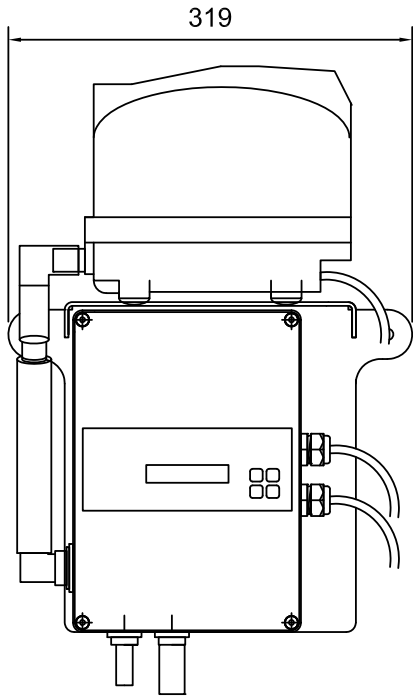
DESCRIPTION

GRAF ONE2CLEAN

REV P0

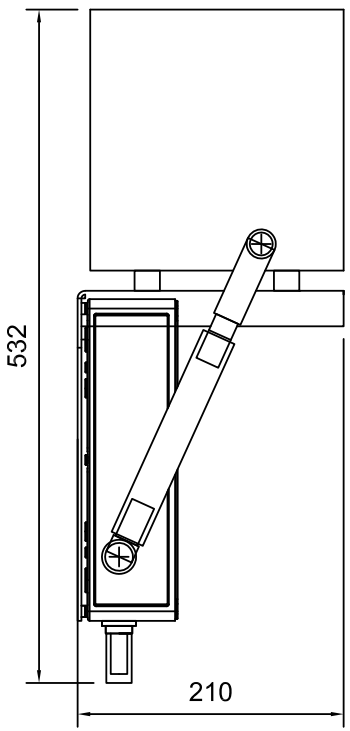
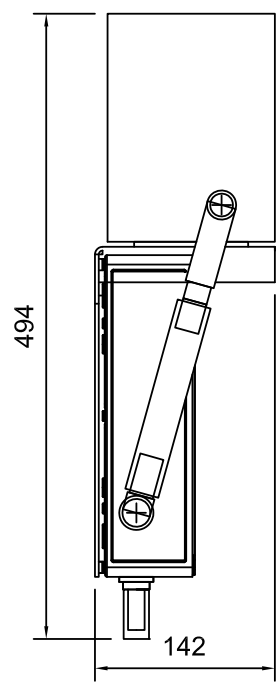


D	Steuerung one2 clean XP und HP Version	Artikel-Nr. article no.
GB	control unit one2clean model XP and HP	ES
		FR



Hiblow
XP - air pump
for 3, 5, 7 PE

Hiblow
HP - air pump
for 9, 10, 14, 18 PE



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Otto Graf GmbH Carl-Zeiss-Str. 2-6 DE-79331 Teningen Germany info@graf.info www.graf.info	Zeichnungsinformation drawing information	Artikelinformation article information	Alle Maßangaben in mm all dimension in mm	
	gezeichnet drawn	CSC		Gewicht weight
	Datum date	09.04.2014		
	Toleranz tolerance	+/- 3 %		

9

INSTALLATION OF AIR HOSES AND EXTERNAL CONTROLLER

* Must be installed within 18m of tank. (Air hoses are 20m in length)



1

Connect 13mm hose here

Connect 19mm hose here

Connect hoses as shown (13mm hose to red barbed connector, 19mm hose to blue barbed connector), secure with jubilee clips and then feed hoses through duct to controller ensuring hoses are not kinked.

2

The controller must be installed in a well vented, dry and dust-free interior. Two 8mm holes must be drilled into the wall for assembly.

3

Secure the controller to the wall using the dowels and screws provided.

4

Position the compressor on the controller. Connect the compressor to the unit pipe using the 90-degree hose piece and hose clamps provided. Plug the compressor plug into the control socket.

5

Connect the air hoses to the nozzles on the controller (13mm hose to black nozzle and 19mm hose to blue nozzle) and secure with jubilee clips.

6

The controller requires its own, permanent adequately fused (13 amp) power supply. Fitted with an isolator switch for repair and maintenance.

9 INSTALLATION OF AIR HOSES AND INTERNAL CONTROL



7

To prevent fumes from the system entering the property via the service duct, please use blanking plug and connect the hoses accordingly.

8

For instructions on how to set the Date & Time, please refer to Document No. Graf-0005 Rev.1

9

For all other information please refer to the One2Clean Log Book.

9

INSTALLATION OF AIR HOSES AND EXTERNAL CONTROLLER

* Must be installed within 18m of tank. (Air hoses are 20m in length)



1

Selecting the location

- The location must be protected from direct sunlight during the summer.
- The rear side of the cabinet must be installed with at least 10cm clearance from the nearest wall to allow for sufficient ventilation.
- The air hoses must be no longer than 20m.
- The cabinet must not be installed in ground water. This also applies to groundwater or backwater that occurs only occasionally.

2

Installing the cabinet in the ground and connecting the service duct

Excavate a hole of sufficient size for the cabinet (installation depth 50cm). Only coarse excavated soil that is free from stones may be used as backfill material is unsuitable, round gravel should be used (size 8-16mm). Make sure the cabinet is stable and is installed vertically in the excavation.

Push the 110mm pipe through the seal in the bottom of the cabinet. Fit a 45 degree bend to the end of the pipe inside the cabinet with the open end facing upwards.

3

Inserting the underground power supply cable

Drill a 20mm diameter hole in the side of the base section of the cabinet at a suitable position for the armoured power cable to feed through. Fit the M10 x 1.5mm cable gland (suitable for a cable diameter of 8-13mm).

4

Electrical connection

The electrical connection must only be carried out by a qualified electrician. An underground armoured cable must be laid to supply power to the cabinet. This cable must be protected by a 13 amp fuse from the building installation and must be fitted with an isolated switch for repair and maintenance. The underground cable is connected to the pre-assembled power socket in the cabinet. This power socket can be removed for easy assembly by unscrewing the two nuts from the holding plate.

5



Prior to installation of the control unit, ensure the spacer has been fitted to the back of the control unit.

6



The control unit should be mounted to the external cabinet with the screws and wing nuts provided.



7



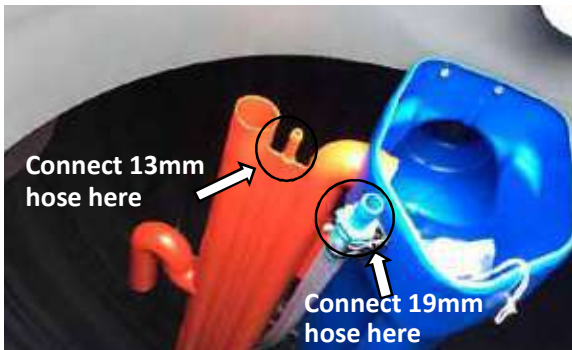
Position the compressor on top of the control unit and connect together using the 90-degree hose piece and hose clamps provided.

8



Connect the air hoses to the nozzles on the controller (13mm hose to black nozzle and 19mm hose to blue nozzle).

9



Connect hoses as shown (13mm hose to red barbed connector, 19mm hose to blue barbed connector), secure with jubilee clips and then feed hoses through duct to controller ensuring hoses are not kinked.

10



Install a 90-degree bend on the inlet to the chamber and feed through the two hoses. Fit barbed connectors to each hose and secure with jubilee clip. Connect to underside of blanking plug.

11



Push blanking plug into end of 90-degree bend. Connect short lengths of hose to connectors on the blanking plug and the connect to appropriate barbed connectors on controller.

12



For instructions on how to set the Date & Time, please refer to Document No. Graf-0005 Rev. 1. For all other information please refer to the One2Clean Log Book.

10 **INSTALLATION OF THE EXTERNAL CONTROL CABINET (S)**

Art. No. 107990



The points described in these instructions are to be respected without fail. If they are not respected, any claim under guarantee will be considered null and void. For all additional articles obtained by way of GRAF, you will be provided with separate installation instructions enclosed in the transport packing.

The components must be examined without fail for any damage before placing the unit in the trench.

Separate instructions will be provided for the operation and maintenance of the installation.

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1. Scope of supply and accessories

1.1 Scope of supply

The external switch cabinet for EPP consists of the lower part and the cover hood with:

- Lock security pin with installation material
- 2 locking screws, M8, for fitting the one2clean control unit (wing nut and washer enclosed with the one2clean control unit).
- Cable screw connection M20x1.5 for power supply

1.2 Accessories required

The installation of the switch cabinet requires the following items:

- Empty pipe closure element, rated diameter 100 for the gas-tight closure of the technical connection pipe
- KG pipes, rated diameter 110, as technical connection pipe to the clarification system
- Earth contact coupling for the electrical connection of the control unit

2. Choosing the location

When choosing the location for the cabinet, the following points must be borne in mind:

- During the summer months the location should be protected from direct sunshine.
- The rear face of the cabinet must be placed with at least 10 cm of clear space from the nearest wall.
- Operation can be noisy! The air compressor produces a sustained noise of long duration when in operation (comparable to an oil heating fan or a freezer cabinet).
- The air hoses should not be longer than 20 metres.
- The switch cabinet must not be allowed to stand in ground water. This also applies to ground water or backed-up water which only occasionally occurs.
- Power supply is to be via a separately fused power connection (16 Ampere, time-lag). Any additional consuming components on the same fuse can interfere with operations.

The connection of the empty technical supply pipe is effected to the side of the cabinet with the aid of a cable connection socket with rated diameter of 110.

10 INSTALLATION OF THE EXTERNAL CABINET (S)

3. Installing the cabinet in the earth

The black venting outlet is to be fitted onto the cover of the cabinet.

An adequately large trench is to be dug, with the installation depth of the cabinet being 35 cm. The cabinet is then placed in the trench. As backfill material, only cohesive excavated soil may be used, free of any stones. In the event of the excavated material being unsuitable, round grain gravel (maximum granulation 8/16) is to be used.

Care must be taken to ensure that the cabinet is standing firmly and vertically upright in the excavation.

3.1 Connecting the empty technical supply pipe to the clarification system

The empty technical supply pipe is connected via a pipe plug with rated diameter of 110 to the socket provided for this purpose.

3.2 Introducing the earth cable for the power supply

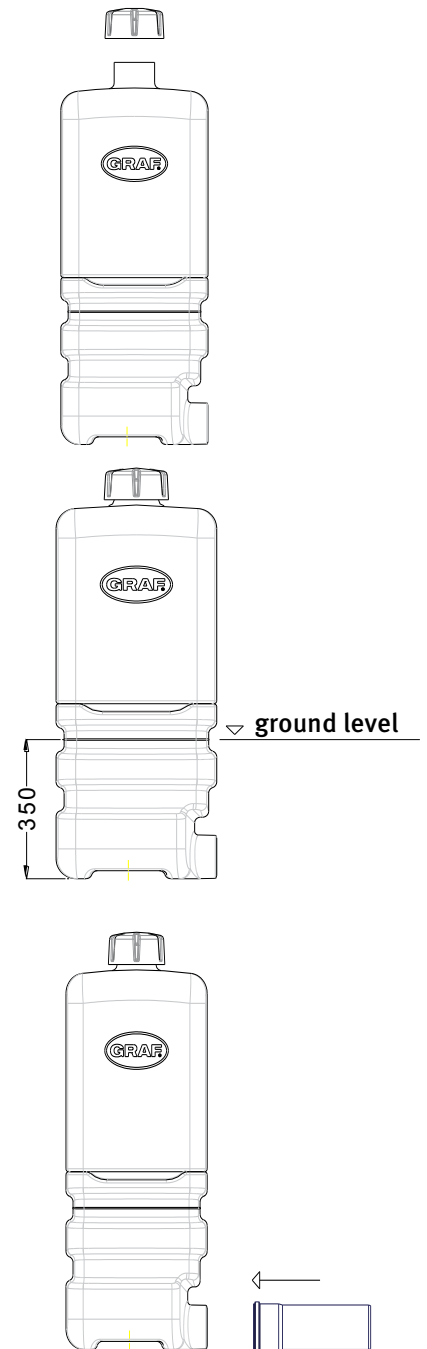
The power cable is to be introduced into the cabinet by way of a M10x1.5 cable screw connection (suitable for cable diameters of 8-13 mm). A drill hole with diameter of 20 mm is to be provided for this purpose.

3.3 Electrical connection

The electrical connection of the switch cabinet may only be carried out by a qualified electrician.

The power supply requires an earth cable to be laid to the cabinet. **This cable must be fused with a 16 Amp fuse via the in-house installation, and must be capable of being isolated from the mains network.**

The connection for the control unit must be provided via a fused contact coupling to be provided by the client.



Provide fuse for the connection

10 INSTALLATION OF THE EXTERNAL CABINET (S)

4. Fitting the closure unit

The lock security pin is to be inserted through the cover from the inside to the outside. Securing is provided with the M4x12 screws.



10 INSTALLATION OF THE EXTERNAL CABINET (S)

5. Fitting the one2clean control unit

5.1 Inserting the one2clean control unit

The one2clean control unit is secured with the locking screws and wing nuts provided. For this purpose the screws are to be introduced from the outside into the interior.

The securing material which is enclosed with the one2clean control unit is not required.



5.2 Connecting the air hoses

The air hoses are conducted via the empty pipe laid in the earth to the planned location of the cabinet. The hoses are to be shortened in such a way that they are not under any tension and cannot be kinked.

The hoses are to be connected to the hose sockets on the control unit. For the fitting we recommend that the ends of the hoses be warmed.



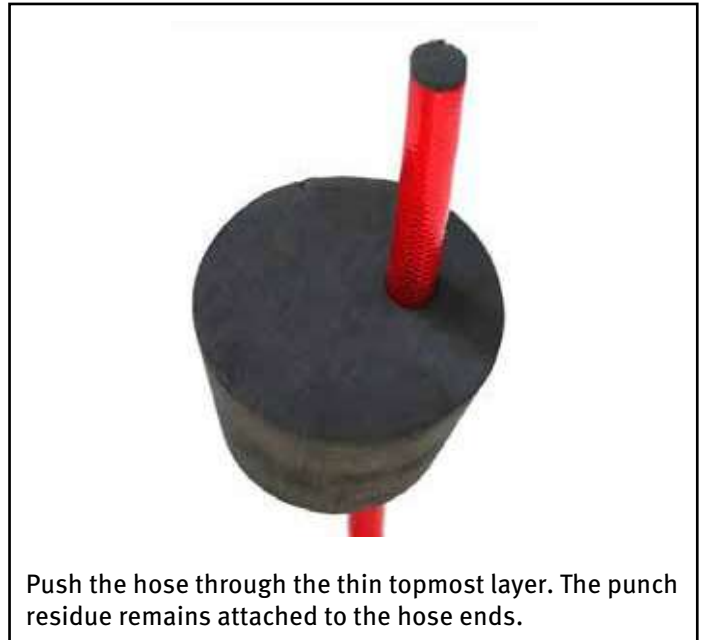
The empty pipe must be closed off at least on the side of the control unit, so that any gas exchange by way of this pipe can be excluded (explosion protection, moisture, odours).

Close off the empty pipe

For this purpose we recommend the GRAF empty pipe connection made of PE foam material (Art. No. 107887).

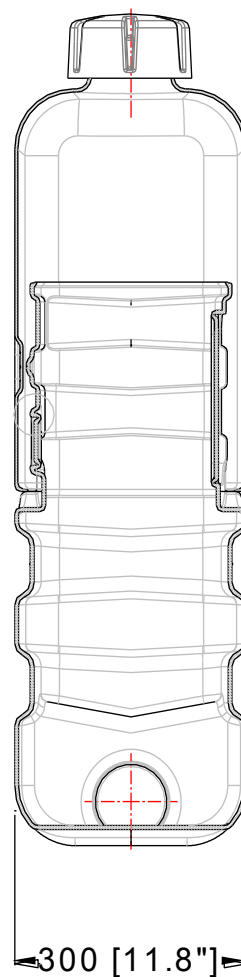
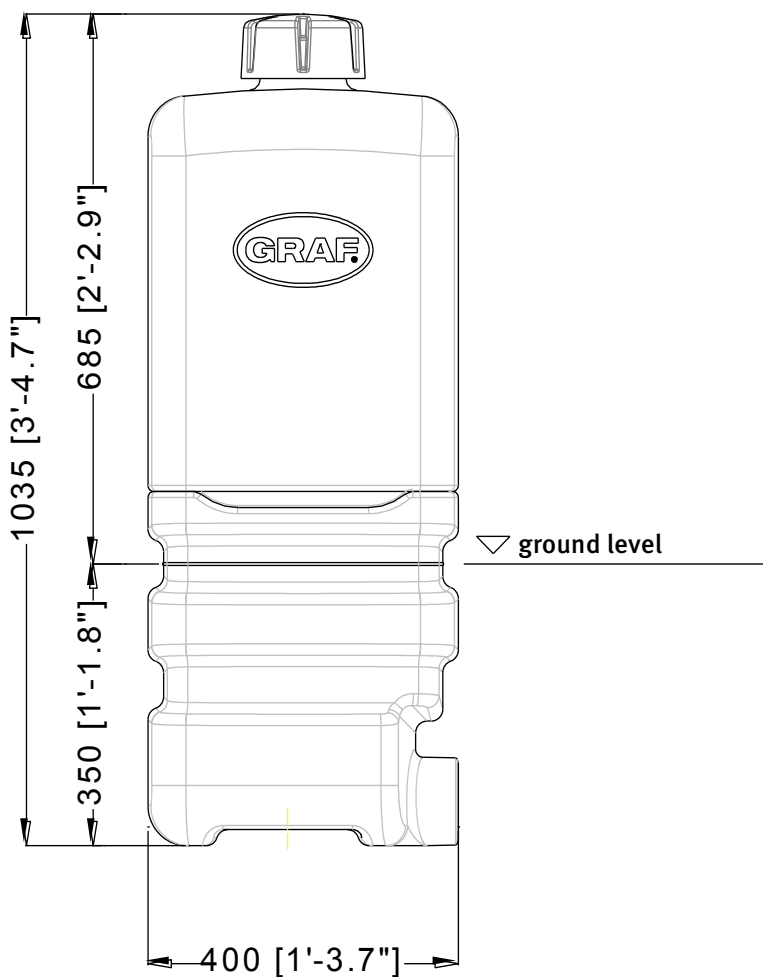
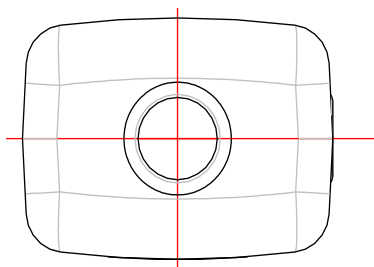
10 INSTALLATION OF THE EXTERNAL CABINET (S)







5.3 Fitting the GRAF empty pipe closure element made of PE foam material



10 INSTALLATION OF THE EXTERNAL CONTROL CABINET (S)

6. Dimensions



With unit turned on			Cycle pause rest: 684:44min
Press			
Press		X5	19:33:40 2014-05-21 we
Press			1□:33:59 2014-05-21
Press	 	To change hours to correct time	
Press		To move to minutes	09:3□:59 2014-05-21
Press	 	To change minutes to correct time	
Press		To move to date	09:11:59 201□-05-21
Press	 	To change the year	
Press		To move to month	09:11:59 2016:0□:21
Press	 	To change the month	
Press		To move to day	09:11:59 2016-01-2□
Press	 	To change the day	
Press		To store new settings	
Press		To go back to auto mode	



RAINWATER HARVESTING



STORMWATER MANAGEMENT



WATER BUTTS & COMPOSTERS



MULTIPURPOSE CONTAINERS



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LOG BOOK

ONE2CLEAN TANKS

The drainage system from this property discharges to a wastewater treatment plant (or septic tank, as appropriate). The owner is legally responsible for routine maintenance and to ensure that the system complies with any discharge consent issued by the relevant authority for your area and that it does not present a health and safety hazard or a nuisance.

Graf UK recommend service and maintenance should be carried out at least once a year by a qualified engineer.

For further details contact Graf UK on 01608 661500.

One2Clean system

Benefits of the Graf system

- Extremely strong & robust injection moulded underground tank
- No concrete required, just gravel base and backfill
- Completely groundwater stable up to the centre line
- CE Certified system to EN 12566-3
- Market leading effluent quality of 5, 6, 0.4 guaranteed on a 95 percentile basis. SBR Technology
- Integrated sampling chamber at no extra cost
- No moving parts inside the tank, easy to install, easy to maintain.
- Plug in and play system, no wiring required
- 10 year warranty on the tank, 2 years on compressor and parts, German engineered
- Low energy consumption of just 75 kwh
- Silent operation
- Programmable holiday mode



Only substances with the characteristics of domestic wastewater should enter the systems. Substances which are not biocompatible or biodegradable must not enter the system because they can block the pipes, contaminate the wastewater or kill necessary bacteria.



The following are not permitted:

- Rainwater from roofs and yards
- Infiltration water (e.g. drainage water)
- Liquid or solid residue from keeping animals
- Commercial or agricultural wastewater, unless it is comparable to domestic wastewater
- Chemicals, pharmaceuticals, mineral oils, solvents
- Cooling water
- Solids in the form of food waste, plastics and hygiene articles, coffee filters, bottle tops and other domestic items
- Milk and milk products
- Water discharged from swimming pools
- Large volumes of blood

If discharging larger volumes of grease or plant-based oils, we would recommend pre-cleaning the wastewater containing the greases/oils in a grease separator upstream of the wastewater treatment system (caution: faeces must not be allowed to enter the grease separator!).



Please don't flush or pour

- | | |
|-------------------------|--|
| Ash | Cleaning agents, except chlorine-free products (environmentally sound) |
| Chemicals | Razor blades |
| Disinfectants | Pipe cleaners |
| Paints | Pesticides |
| Photochemical | Panty liners |
| Chip fat | Cooking oil |
| Adhesive plaster | Food waste |
| Cat litter | Wallpaper paste |
| Cigarette butts | Textiles (e.g. nylon tights, cleaning cloths, handkerchiefs etc.) |
| Condoms | Thinner |
| Corks | Bird sane, cat litter |
| Varnishes | Cotton buds |
| Medicines | Toilet blocks |
| Engine oil | Nappies |
| Waste containing oil | Cement water |
| Plant protection agents | |
| Paintbrush cleaners | |



Otto Graf GmbH, Carl-Zeiss-Str. 2-6, Germany

2014

EN 12566-3:2013-09

Packaged domestic wastewater treatment plant
for treatment of domestic wastewater

SBR-treatment one2clean for 3-18 inhabitants

Material: Polypropylene (PP)

Effectiveness of treatment

Treatment efficiency ratios (at tested organis daily load BOD5=0,48 kg/d) Ammonia nitrogen Total nitrogen	COD:	96,2%
	BOD5:	98,6%
	SS:	98,6%
	NH4-N:	99,0%
	Ntot:	79,1%

Treatment capacity (nominal designation)

Nominal organic daily load (BOD5)	0,06 kg/d*PE
Nominal hydraulic daily flow (QN)	0,15 m3/d*PE

Watertightness
(water test)

passed

Crushing resistance
(pit test)

passed

Durability

passed

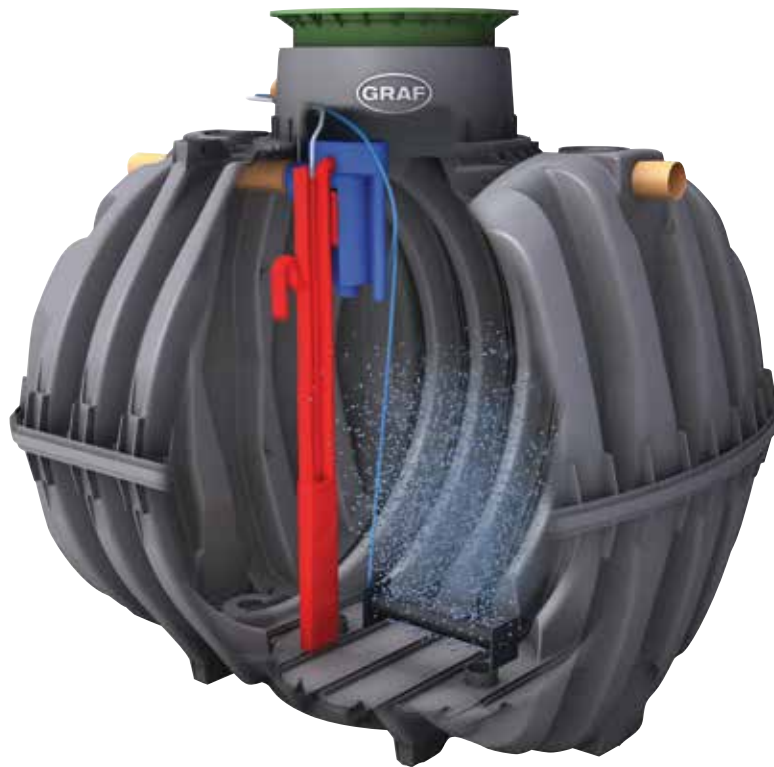
Reaction to fire

Class E

Release of dangerous substances

NPD

Valid for one2clean plants build in Carat underground tanks



It is essential that you observe the points described in these instructions. Failure to do so will invalidate all warranty claims. For all additional items ordered from GRAF, separate installation instructions will be provided in the transport packaging.

It is essential that you check the components for possible damage before installation.

Contents

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Important tips for safe & long-lasting operation of the one2clean:

- The SBR system is designed for the treatment of all household sewage. The introduction of other wastewater, such as the wastewater from restaurants and/or business establishments, etc. is permitted if these were already known at the time of design of the system and were taken into account.
- Biocides, materials with a toxic effect or materials that are not biologically compatible must not enter the system, as these impede bacteria important for wastewater treatment and lead to biological process problems (detailed notes follow on the next pages).

It is imperative that you follow the operating and maintenance instructions for compliance with the regulatory requirements for cleaning. These instructions can be found on the following pages.

Furthermore, we ask that you carefully read and observe the following notes:

- The location of the control system for indoor installation must be a dry, well-ventilated room (basement or garage).
- If an outdoor control cabinet is used, this should be placed in as shaded place as possible to avoid overheating.
- At no time must the cabinet be covered, in particular its air vents, and that it is freely accessible for maintenance.
- There must be a permanent power supply to the one2clean. Ensure that the control cabinet is adequately fused (16 A) and the power supply is fitted with isolator switch for repair & maintenance. Additional electrical components & consumers should not be using the same fuse as they can could power failure and interfere with one2clean operation.

The one2clean small wastewater treatment system is fully biological and works according to the retention process with long-term aeration (sequencing batch reactor). The system is essentially made up of an aerobic stage. This stage is split into a rest area and an activation area. The chambers are connected to one another in the bottom section. During this process, therefore, all domestic sewage is immediately exposed to aerobic wastewater treatment. The entire system is aerated by compressed air being blown in and the sludge activated as a result of this biologically cleans the wastewater.

The coarse and floating solids contained in the wastewater are initially retained in the rest area by means of a baffle. The wastewater then passes through an overflow opening in the lower part of the container from the rest area into the activation area.

As the rest area is also aerated, the solids which remain behind are also degraded aerobically over time. Wastewater treatment is performed in the one2clean without pre-treatment, so that no anaerobic digestion processes can occur.

Operation of the treatment system is carried out via a microprocessor control system which controls the air compressor and air distribution.

The SBR process is a sequence of different steps that occur at set times in a sequence and takes place at least once a day.



Step 1: Aeration

The wastewater is subjected directly to aerobic treatment for a fixed amount of time. On the one hand the microorganisms (activated sludge) are supplied with the oxygen necessary for degradation; on the other hand mixing is achieved as a result of pressure aeration. The air diffuser of the system is supplied with ambient air by a compressor. The aeration is intermittent, so as to allow targeted wastewater treatment. Thus, different environmental conditions can be achieved.



Step 2: Settling

There is no aeration in the second phase. The activated sludge and the remaining settleable solids can now settle by gravity. A clear water zone is created at the top and a layer of mud forms at the bottom. Any floating sludge which might develop is located above the clear water zone.



Step 3: Clear Water Removal

The biologically treated wastewater (clear water) is extracted from the SBR stage. This is done by pumping compressed air according to the mammoth pump principle (air lift pump). The air lift is designed in such a way that no floating sludge which might develop is drained on the clear water layer. A minimum water level in the system is maintained without additional components.

After execution of the third Step, the cleaning process begins again with step 1.

Two cycles are performed per day. The individual adaptation of switching times is possible on the part of the maintenance company.

After the system is connected to the power supply, a short system test is run, during which time the LED light is red. The LED then becomes green when the start-up phase is completed.

During the system test, the notification "SYSTEM TEST ... OK", the program version, and serial number of the control system appear for a short time. Following this, the current operating status of the system is displayed. After the system test is complete, the date and the current time should be checked and adjusted if necessary (see Section 4.2.3).




After checking the date/time, a functional check of the system components must be carried out. This check can only be carried out if the necessary air hoses are connected. The check should be carried out via the menu point "manual mode" in the control system, which is intended for this purpose. The individual parts of the system are tested for functionality. After a successful check, the system is reset to automatic mode.


CAUTION: The clear water siphon only functions when the containers are filled.

If the date and time are not set correctly, operating faults will be stored with the incorrect time information.

4 OPERATION OF THE CONTROL SYSTEM


The operation of the system is carried out via a microprocessor in the control unit. The microprocessor allows for the set-up of operating parameters, the display of operating conditions and the query of system parameters as well as the programming of working times through a specialist company.

Adjustments are made by scrolling through numerical values using the two arrow keys  . The settings are then confirmed by pressing the  button.

The individual dialogues can be terminated ahead of time by pressing  or will be terminated automatically after **2 minutes**.

The control system is broken down into the following display pages:

4. Basic level: Status of the cycle sequence with the elapsing remaining time, as well as the display of error messages.

5. Operator level: The operator can access the operator level by pressing  the button and enter operator- specific settings.

6. Service level: A password-protected service level can be accessed from the operator level using an additional code. This level is reserved for trained personnel. Here adjustments or changes can be made and diagnostic data is retrieved.



Figure 2: View of the operating unit

4.1 Control Programme

The control system switches the outputs for air compressors and stepper motors on a timer. The timing is determined by the set sequence tables. A complete cleaning cycle is started for each start time in accordance with the selected sequence table.

By setting up holiday times in the operator level, the complete sequence of cleaning cycles can be suppressed for the set period of time. Only one holiday cycle with greatly reduced activity takes place at this time. During this time, no treated wastewater will be removed, as there should be no supply.

OPERATION OF THE CONTROL SYSTEM

4.1.1 Display of Operating Status

The operating status is indicated by the LEDs (green = operational / red = fault) and as text on the screen.

In normal operating mode (aeration mode), the display appears as follows:





Aeration Rest: 120:10min

In automatic mode, the liquid crystal display shows the current work phase and the remaining time left in this phase.

If a fault occurs, the red LED is turned on. A message indicating which component is faulty appears in the liquid crystal display (e.g. Fault Compressor o.oA).





4.1.2 The following work phases are displayed




Display	Process performed
Denitrification	Y ₃ valve (plug X1.1) is actuated intermittently; the activated sludge is briefly mixed with the wastewater. This is followed by long pauses (response times).
Ventilation	Y ₃ valve (plug X1.1) is actuated; the system is aerated in intervals over a long period of time.
Sedimentation phase	No valves are actuated, the activated sludge settles in the system.
Activity phase	Y ₄ valve (plug X1.2) is actuated; the clear water is pumped into the drain.
Cycle pause/holiday mode	Y ₃ valve (plug X1.1) is actuated; the system is aerated in intervals (considerably less than in the aeration phase).
Rest: XXX:XXmin	Display of remaining time.

Symbol	Key assignment	Function
	Enter key	Selection of operating mode, confirmation of entries
 	Scroll	Display of operating modes and queries Programming of the system by entering figures
	Acknowledgement	Acknowledgement of entries without saving Acknowledgement of fault messages


4.2 Operating the Control System

You can start different queries from the automatic mode.




You can access the first operating level by pressing . You can now call up the individual queries using the arrow keys   and then pressing :



Display	Meaning
Operating mode Remaining time	Remaining time in current work phase
Operating hours	Display of the operating hours of the valve and compressor
Manual operation	Manual control of the valve
Date Time	Current time, day and date. Can be set using 
Holiday mode	Holiday mode set-up (max. 90 days)
Faults	Operational faults which occur are stored here and can be read. It is possible to switch between the error message and the corresponding date using  and 
Settings	The current settings can be viewed using the arrow keys
Service menu	For qualified personnel

4.2.1 Operating Hours Query

Press the  button. On the screen will appear:

Operating hours
meter reading

By pressing  again, the operating hours for the valves and the compressor can be displayed in sequence using the arrow keys  .

Pressing  once will take you back to the display “display operating hours”. You can access the “manual mode” menu by pressing .

→ **Note:** If you do not press any buttons for a period of 10 minutes, normal operation will begin automatically.

OPERATION OF THE CONTROL SYSTEM

4.2.2 Manual Control of the Valve using “Manual Operation”

During checks, each valve should run for at least 5 seconds, as the monitoring the current consumption of the valves takes some time before any faults are detected.

In automatic mode, first press **Set** then the arrow key **▲** until the following is displayed on the screen:

Manual operation

By pressing on the **Set** button again, you will receive the following message:

Aeration OFF

Pressing **Set** allows you to turn the selected programme on and off.

The other programs can be selected using the arrow keys **▲**.

Pressing **Esc** once will take you back to the display “manual mode”.

4.2.3 Set Date/Time

Press **Set** and then the arrow keys **▲** until the following is displayed on the screen (example):

19-12-2007 Mon
20:15:56

By pressing **Set**, the time and date can then be set using the arrow keys **▲** **▼**.

To confirm the correction, you must press **Set** each time.

Pressing **▲** once will take you to the next display in holiday mode.

A correctly set system clock and date display is absolutely mandatory in order to record the hours of operation and so that any faults can be traced. There is no automatic change from summer to winter time.


NOTE: If you do not press any buttons for a period of 10 minutes, normal operation will begin automatically.

4.2.4 Setting-up Holiday Mode

NOTE: Holiday mode results in the reduced operation of the wastewater treatment system. It should only be applied when no wastewater is introduced into the wastewater treatment system during the selected time period. Wastewater that passes into the system during the holiday mode period will not be cleaned. Holiday mode is switched on and off automatically for the data you have entered.




Press , then press the arrow buttons   until the following appears on the screen:

Vacation oper.



Press  again to release the input of holiday dates:


Start: YYYY-MM-DD
 End: YYYY-MM-DD


Start of holiday:

The start of holiday mode is entered in the format YYYY-MM-DD by pressing  . To switch between the different settings, the  button must be pressed in each case.

End of holiday:


As with for the start of the holiday, the end of holiday mode is entered in the year, month and day format YYYY-MM-DD by pressing  .

Press the  button to save the input data for holiday mode and to exit this function.

Pressing  returns you to the automatic mode display.

NOTE: If you do not press any buttons for a period of 2 minutes, normal operation will begin automatically without the date that you have just entered being saved.

4.2.5 Old Faults




The control system stores all past fault messages and the operation of the control system via the “manual mode” function. Past fault messages with date and time can be read under the menu item “Old faults”. The individual messages can be accessed using the arrow keys. You can exit the menu item by pressing .

Faults are indicated as encoding, in order of their appearance, starting with number 0 (latest signal).

Coding	Meaning
1	Power failure (system is currentless)
2	Net is back (system regains power)
3	Compressor has over-current
4	Compressor current supply too low
5	Manual operation

The faults number 2 (net is back) and number 5 (manual operation) are no faults. They will be registered for a better temporal localization of possibly occurring faults or rather monitoring of manual activities on the control system.

4.2.6 Display Settings

This menu item allows the current control system settings to be seen. It is not possible to change these settings. This menu item is used to analyse the settings without making changes. The individual settings can be called up using the arrow keys  . You can exit the menu item by pressing .

4.2.7 Service Menu

Operating parameters can be changed in the service menu. Access is protected with a code. This second maintenance level is reserved exclusively for qualified specialist personnel only!

Any access to the control system settings by unauthorised persons will cause the warranty to expire!

5.1 Obligations of the Operator

The system must always be turned on. The operator is obliged to ensure the fault-free operation of the system. Almost all operational faults lead to a deterioration of the system's cleaning performance. These should therefore be detected at an early stage and eliminated immediately by you or a qualified service technician.

5.1.1 Daily checks

The system should be checked daily for correct operation. The system is operating correctly when the operating control is lit up green and no warning signal can be heard.

5.1.2 Monthly checks

- Visual inspection for any sludge output, turbidity or discoloration in the flow
- Check inflows and outflows for blockages (visual inspection)
- Read the operating hours counter on the air compressor (total operating hours), the ventilation (Y3 valve) and the clear water run-off (Y4 valve) and record in the operating log

5.2 Maintenance by a Specialist Company

Maintenance is carried out by a specialist company (experts) at least twice a year (approximately every 6 months). The time intervals and tasks specified by the local water authority in the consent permit under water laws also apply. For this purpose, the system owner must complete a maintenance contract with a qualified specialist.

- The following tasks should be carried out in relation to maintenance:
- Inspection of the log book with determination of the regular operation (target-actual comparison),
- Check the air filter of the air compressor,
- Maintenance of the air compressor according to the manufacturer's instructions,
- Functional check of the air compressor and stepper motors,
- Carry out general cleaning work, e.g. removal of deposits,
- Check for adequate ventilation,
- Examination of activation tank:
 - Oxygen concentration ($O_2/l > 2 \text{ mg}$), adjust the operating time of the compressor if necessary,
 - Sludge volume ($< 900 \text{ ml/l}$),

If the sludge volume is greater than 900 ml/l, the sludge must be removed.

Maintenance tasks carried out, any damage detected or repairs made as well as other instances should be summarised by the maintenance company in a maintenance report.

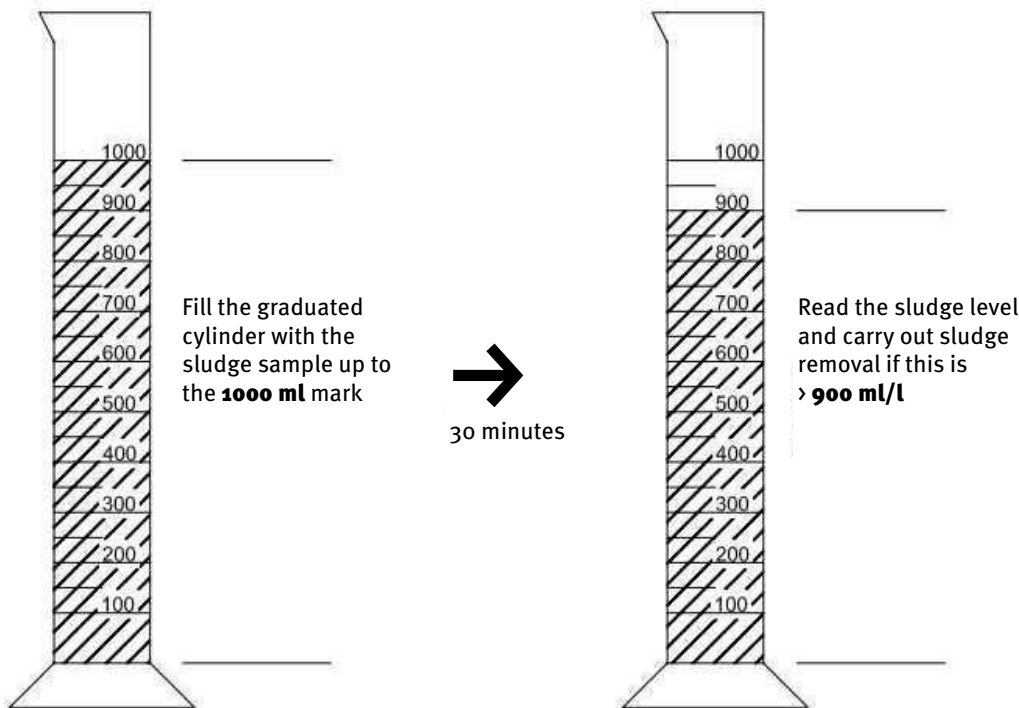
5.3 Determination of Sludge Removal

In order to determine the need for sludge removal in the wastewater treatment system, a settling test should be carried out at maintenance intervals. For this settling test, the SV_{30} is measured. The SV_{30} is the sludge volume occupied by 1000 ml of activated sludge after a settling period of 30 minutes. It is a measure of the amount of sludge present in the wastewater treatment system.

Measurement of the SV_{30} is carried out in a 1000 ml graduated cylinder.

The following points must be observed during this measurement:

- A. Turn ventilation on - if not active - and allow to mix for a short time
- B. Submerge the scoop into the tank and remove sludge sample
- C. Fill the graduated cylinder with the sludge sample up to the 1000 ml mark
- D. Let the cylinder containing the sample stand in a place free from vibrations for 30 minutes
- E. Read the sludge level and carry out sludge removal if this is $> 900 \text{ ml/l}$
- F. After emptying the tank have to be filled up with fresh water again



5.4 Sludge Removal

Removing sludge from the wastewater treatment system should be carried out according to the following points:

- G. Remove the cover
- H. Remove the deposits on the water surface and on all visible surfaces (baffle, sample container, siphon)
- I. Wash down the visible surfaces
- J. Insert the suction hose into the wastewater treatment tank until it reaches the floor
(CAUTION: air admittance valves on the ground must not be damaged!)
- K. Aspirate until about 30 cm of wastewater and sludge remain in the wastewater treatment system

Technical problems of system operation (failure of a unit) are visually displayed.

6.1 System Behaviour after switching off the Power Supply

If the system is disconnected from the mains (e.g. power failure), the control program and the counted operating hours are retained due to the memory of the control system. The red LED will light up. When the system is supplied with power again, it will self-start.

NOTE: If the system is disconnected from the mains for more than 24 hours, cleaning of the existing wastewater is not or is only possible to a very limited extent.

6.2 Fault Message in the Display

Faults are shown as text or as numbered codes on the liquid crystal display. The operating control lamp then lights up red.

The numbered fault codes are explained below:

- A. Power failure (system is de-energised)
- B. Power returned (system is supplied with power again)
- C. Compressor has overcurrent
- D. Compressor power supply too low
- E. Manual operation

The displays no. 2 (power returned) and no. 5 (manual mode) are not faults in the proper sense. These are only registered as fault messages for better time limitations of any faults that occur and for monitoring manual activities on the control system.

Table 2: **Fault Causes and Troubleshooting**

Display	Possible cause	Remedy
Mains failure No display, no light	<ul style="list-style-type: none"> • Power failure • System turned off • There is no voltage at the control cabinet 	<ul style="list-style-type: none"> • Check the power supply to the system and to the control system • Turn system back on • Check supply to the control cabinet • Wait for resumption of power supply
No display, light is green		<ul style="list-style-type: none"> • Turn system off and back on again after 10 seconds
Mains returned	<ul style="list-style-type: none"> • Power available again 	
Set the clock	<ul style="list-style-type: none"> • Internal clock/date not set 	<ul style="list-style-type: none"> • Set date and time via menu item
Compressor **overcurrent**	<ul style="list-style-type: none"> • Short-circuit 	<ul style="list-style-type: none"> • Check supply to the control cabinet
Compressor **current too low**	<ul style="list-style-type: none"> • Compressor does not work / is not receiving power 	<ul style="list-style-type: none"> • Check the compressor in manual mode
Manual operation	<ul style="list-style-type: none"> • System was activated manually in manual mode 	

6.3 Unusual Water Levels - Fixing a Fault

Observation	Possible cause	Remedy
The water level in the activation tank is unusually high	<ul style="list-style-type: none"> • System is running in holiday mode • System runs continually in cycle pause • Control system settings are incorrect • The drain siphon is clogged • The air hose to the drain siphon is leaking • System has been flooded from external water source and not allowing water to drain from the system • Control system is defective 	<ul style="list-style-type: none"> • End holiday mode • Have the control system settings checked by the maintenance technician • Allow tank to be pumped out and clean siphons • Seal hose connections • Wait out flooding • Get in touch with maintenance company
The system smells, the treated water is cloudy or discoloured	<ul style="list-style-type: none"> • Too little air is entering the system • Single-sided ventilation due to defective air admittance valves 	<ul style="list-style-type: none"> • Have service company increase ventilation time • Check the ventilation, get in touch with maintenance company
Ventilation is onesided or large air bubbles appear at points	<ul style="list-style-type: none"> • Membrane unit is defective • Seal leaky air admittance valves 	<ul style="list-style-type: none"> • Get in touch with maintenance company • Get in touch with maintenance company

Essentially, the system should only be supplied with materials that correspond to domestic wastewater in their characteristics.

Biocides, materials with a toxic effect or materials that are not biologically compatible or degradable must not enter the system, as these lead to biological process problems. The following, in particular, should not be introduced into the system:

- Rainwater from roofs and courtyards,
- Extraneous water (e.g. drain water)
- Residues from livestock in solid or liquid form,
- Industrial or agricultural wastewater, as far as it is not comparable to domestic wastewater,
- Chemicals, pharmaceuticals, mineral oils, solvents,
- Cooling water,
- Coarse materials in the form of food scraps, plastics and hygiene products, face wipes, coffee filter papers, bottle caps and other household items,
- Milk and dairy products
- Drain water from swimming pools,
- Large amounts of blood.

In the case of large amounts of fats or vegetable oils, it is recommended that the fatty wastewater is pretreated in one of the grease traps upstream of the wastewater treatment system (Caution: No faeces may be introduced into the grease trap!).

The following is a list of individual substances which must not be disposed of via the wastewater treatment system:

Solid or liquid substances that do not belong in the sink or in the toilet:	What it does:	Where it should go:
Ash	Does not decompose	Dustbin
Chemicals	Contaminates wastewater	District collection point
Disinfectants	Kills bacteria	Do not use
Paints	Contaminates wastewater	District collection point
Frying fat	Accumulates in pipes and leads to blockages	Dustbin
Adhesive plasters	Clogs pipes	Dustbin
Cigarette ends	Accumulates in the system	Dustbin
Condoms	Causes blockages	Dustbin
Corks	Accumulates in the system	Dustbin
Medication	Contaminates wastewater	Pharmacy
Engine oil	Contaminates wastewater	District collection point
Oily waste	Contaminates wastewater	District collection point
Plant protection products	Contaminates wastewater	District collection point
Paintbrush cleaner	Contaminates wastewater	District collection point
Cleaning agents, except those which are chlorine-free (environmentally friendly)	Contaminates wastewater, corrodes pipes and seals	District collection point
Razorblades	Causes risk of injury for workers in sewers and wastewater treatment systems	Dustbin
Drain cleaner	Corrodes pipes and seals, contaminates wastewater	District collection point
Pesticides	Contaminates wastewater	District collection point
Panty liners/Sanitary towels	Leads to blockages, non-degradable plastic film spoil water	Dustbin
Cooking oil	Leads to deposits and pipe blockages	District collection point
Food leftovers	Leads to blockages, attracts rats	Dustbin
Wallpaper paste	Leads to blockages	District collection point
Textiles (eg. nylon tights, cloths, handkerchiefs, etc.)	Clogs pipelines, can cripple a pumping station	Charity shop
Thinner	Contaminates wastewater	District collection point
Bird sand, cat litter	Leads to deposits and pipe blockages	Dustbin
Cotton buds/Face wipes	Clogs the system	Dustbin
Toilet blocks	Contaminates wastewater	Do not use
Nappies	Clog pipes	Dustbin
Cement water	Creates deposits, becomes concrete	Send to a specialist company

Manufacturer: Otto Graf GmbH
Carl-Zeiss-Straße 2-6
D-79331 Teningen

hereby declares that the product **one2clean** small sewage treatment system complies with the following Directives:

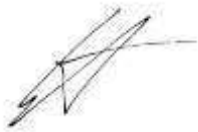
- 2006/42/EC** Directive of the European Parliament and of the Council, dated 17 May 2006, on machinery, and amending Directive 95/16/EC.
- 2006/95/EC** “Directive of the Council relating to electrical equipment designed for use within certain voltage limits”

The following harmonised standards have been applied:

- EN 60204-1** Electrical equipment of machines Part 1: General requirements
EN ISO 13849-1 Safety of machines - Safety-related parts of control systems - Part 1: General principles for design

This EC declaration of conformity becomes invalid if the product is modified without consent.

Teningen, 22.02.14



Arne Schröder
(Product Management Team Leader)

Declaration of performance one2clean

Nr. 008/Translation



1. Unique identification code of the product-type	EN 12566-3: Small wastewater treatment system
2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4)	one2clean 3-18 Inhabitants Type size and serial number on control cabinet type plate
3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer	Cleaning domestic wastewater in a volume of up to 150 l per inhabitant and day with a maximum pollution load of 0.06 kg/BOD₅ per inhabitant and day
4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5)	Otto Graf GmbH Kunststoffherzeugnisse Carl-Zeiss-Str. 2-6 79331 Teningen Germany
5. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V	System 3
6. The notifying authority PIA (Prüfinstitut für Abwassertechnik GmbH) - NB 1739 - tested the cleaning performance of the wastewater treatment system. The Carat tank were tested for stability, leaks, durability and fire behaviour, see number 7. The fire behaviour of the Carat XL tank was tested by the Hoch test institute - NB 1508.	

7. Declared performance			
	Performance		Test report No.
Treatment efficiency	CSB: 96,2 %	26 mg/l	PIA2013-181B14
	BSB ₅ : 98,6 %	5 mg/l	
	NH ₄ -N: 99,0 %	0,4 mg/l	
	N _{ges} : 79,1 %	13 mg/l	
	AFS: 98,6 %	6 mg/l	
Watertightness	Passed		PIA2008-WD-AT0805-1027b
Crushing resistance	Passed		PIA2008-ST-AT0804-1019
Durability	Passed		PIA2008-ST-AT0710-1020+DH
Reaction to fire	Class E		PIA2013-FR-1306-1039

8. **The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 7. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.**

Signed for and on behalf of the manufacturer by:

i.V. Arne Schröder
Team leader, product management

Teningen, 22.01.2014

- Programmable logic microcontroller
- T3,15A fuse (internal)
- Wide-range 100-240 VAC/50-60 Hz power supply
- Real-time clock with 5 min/a deviation, battery back-up
- Logbook, non-volatile
- Cable break monitoring for compressors by measuring output currents
- Operating/error message display with LED (green/red)
- Operating temperature range: 0°C to +55°C
- Permissible temperature range outside of operation: -20°C to +85°C
- Relative humidity: 10% to 95%, no condensation
- Degree of protection IP54, front side (with properly glued front foil)
- 4-key control panel
- Display: 2 lines of 16 characters with backlighting (blue)
- Outputs:
 - 230 VAC 50Hz compressor (standard),
 - 2x 24 VDC step motors/solenoid valves for compressed air flow

WARRANTY CERTIFICATE

Otto Graf GmbH
Kunststofferzeugnisse



Dear Sir or Madam,

Congratulations on the purchase of a quality product from Otto Graf GmbH. Herewith we confirm a 10 years' warranty on the underground rainwater tank

CARAT RS



Warranty clause

Above mentioned 10 years' warranty only refers to the underground tanks and not to individual parts or accessories, even if included in the package price.

Within the warranty period we offer free material replacement, further indemnifications are excluded. In order to grant warranty services we require correct handling, assembly and installation according to the installation manual. The warranty is only valid with the proof of purchase. Please also refer to our general business conditions.

Teningen, March 2016

Otto GRAF GmbH
Carl-Zeiss-Str. 2-6
79331 Teningen
Germany
www.graf.info

WARRANTY CERTIFICATE

Otto Graf GmbH
Kunststofferzeugnisse



Dear Sir or Madam,

Congratulations on purchasing a quality product from Otto Graf GmbH. Herewith we confirm a

2-YEAR WARRANTY

on the small wastewater treatment system one2clean you have purchased.

The warranty applies to the purifying technology only. Accessories and optional add-ons are not covered by the warranty. During the warranty period, Otto Graf GmbH provides free material replacement; but services extended beyond this are not covered.

Warranty conditions

The warranty applies under the following conditions:

- 1.** The waste water treatment system must be installed and commissioned by a specialist firm. Companies trained by Graf UK are recognised as Accredited Service Providers. If a recognised Accredited Service Provider signs off and services the system, 1 extra year of warranty will be added.
- 2.** Maintenance must be carried out in accordance with the logbook and approved by a specialist. In the case of warranty claims, all maintenance reports must be submitted on request.
- 3.** Worn parts and any defects or damage resulting from improper operation of the system, maintenance not being carried out, faults caused by the customer and unauthorised changes to the system are not covered by the guarantee.
- 4.** Costs incurred by installing or replacing parts, shutting down the system etc. are not included in the warranty.

Teningen, March 2016

Graf UK Limited
Regen House
Beaumont Road
Banbury
OX16 1RH

Lined area for notes.



RAINWATER HARVESTING



STORMWATER MANAGEMENT



WATER BUTTS & COMPOSTERS



MULTIPURPOSE CONTAINERS



Graf UK Ltd
Regen House
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Oxfordshire OX16 1RH

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F: 01295 211333
E: info@grafuk.co.uk
www.grafuk.co.uk

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Glasgow
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Prüfinstitut für
Abwassertechnik
GmbH

PERFORMANCE RESULTS

Otto Graf GmbH

Carl-Zeiss-Str. 2 - 6, 79331 Teningen, Germany

EN 12566-3

Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system one2clean

SBR plant in one two-zone polypropylene tank

Test report PIA2014-216B14.01.e

Nominal organic daily load*	0.27	kg/d		
Nominal hydraulic daily load	0.75	m ³ /d		
Material	polypropylene			
Treatment efficiency (nominal sequences)		Efficiency	Effluent	
	COD	94.2 %	43 mg/l	
	BOD ₅	98.0 %	7 mg/l	
	SS	96.3 %	14 mg/l	
	NH ₄ -N**	98.3 %	0.5 mg/l	
	N _{tot} **	87.0 %	7.9 mg/l	
	P _{tot}	80.2 %	1.6 mg/l	
Electrical consumption	0.63	kWh/d		

*at a test influent of ≥ 300 mg/l BOD₅ (mean)

**determined for temperatures $\geq 12^{\circ}\text{C}$ in the bioreactor

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH

(PIA GmbH)

Hergenrather Weg 30

52074 Aachen, Germany

This document replaces neither the declaration
of performance nor the CE marking.



Notified Body
No.: 1739



Certified according to
ISO 9001:2008



Deutsche
Akkreditierungsstelle
D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH

Geprüft - tested - testé

Elmar Lancé

November 2014