GRAF BIOROCK engineered for tomorrow

easyRock small wastewater treatment system

EN **Instructions**

V 01

For proper and safe use, follow the instructions and notes in this document.

- → Read the instructions for use carefully before installation, assembly, and commissioning.
- → Keep for future reference.

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Instructions easyRock small wastewater treatment system

Applicable to:

- easyRock small wastewater treatment system 4 PE 1,800 litres primary sedimentation – Order no. 169300
- easyRock small wastewater treatment system 5 PE 2,250 litres primary sedimentation – Order no. 169301
- easyRock small wastewater treatment system 6 PE 2,700 litres primary sedimentation – Order no. 169302
- easyRock small wastewater treatment system 8 EW 3,600 litres primary sedimentation – Order no 169303

EN

Instructions easyRock small wastewater treatment system

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Contents

EN

1 About these instructions

1.1 Content and structure of the instructions

These instructions are aimed at all those who handle the product, and begin with a description of the product and the most important technical data. This is followed by information on safe handling and possible residual risks, as well as safety instructions for special activities. Following that, there is information on delivery, unloading and transportation as well as specifications and instructions for installation and assembly. The document concludes with a commissioning and maintenance plan and instructions for inspection and maintenance tasks, including troubleshooting and information on decommissioning and disposal of the system.

1.2 Used texts and symbols

These instructions make use of the following texts and symbols. An overview of the safety symbols and signal words used can be found in *Section 3.1*.

Italic text	Reference to other contents in this document or additional information. Digitalised media (e. g. PDFs) present links to the destinations that the user can click or tap directly. Image captions, table captions
»...«	This reproduces lettering or a label on the product or component.

Important / Tip / Info / Note
This highlights important information, tips, and other particularly useful details.

2 Product overview

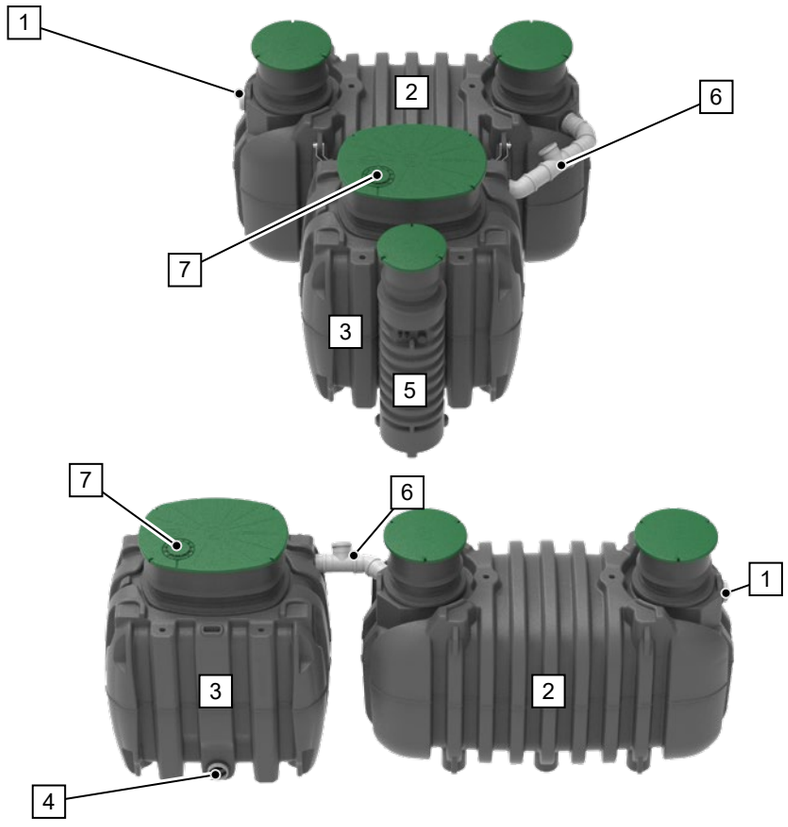
2.1 Product description

easyRock is a fully biological, naturally aerated biofiltration small wastewater treatment system designed for the treatment of domestic wastewater and intended for underground installation. The system consists of a primary sedimentation tank and a treatment unit. With a system size of 4–6 PE, the tanks are joined together at the sides ex works (pack configuration). However, they can also be separated and positioned individually if required (line configuration). From a system size of 8 PE, only the line configuration is supplied.

If required, a pump (optional accessory) can be installed on the front of the treatment unit. At the top of the primary sedimentation tank and treatment unit, there are maintenance and inspection shafts with plastic covers.

The connection for the wastewater inlet is located at the top on the left end face of the primary sedimentation tank. On the opposite side, an overflow system made of plastic pipes connects the primary sedimentation tank to the treatment unit. A prefilter and a branch fitting for connecting the ventilation pipes are installed in the overflow system.

The treatment unit contains a distribution system, biofiltration media and a sampling device. Aeration is located in the shaft cover of the treatment unit. The outlet for the treated wastewater is located at the bottom on the front of the treatment unit.



1 Inlet connection
2 Primary sedimentation tank
3 Treatment unit
4 Outlet
5 Pump (optional accessory)
6 Overflow system and ventilation
7 Aeration

Fig. 1: Overview easyRock small wastewater treatment system, pack configuration with optional pump (top), and line configuration without optional pump (bottom)

2.2 Identifying your system (type plate)

All details for identifying your easyRock small wastewater treatment system can be found on the type plate. Make a note of all important data such as the serial number before installing the system. This information is required to complete the maintenance logs during operation and for any queries to the technical service.

The type plate for the system is located on the inside of the treatment unit's access riser.

The type plate for the pump (optional accessory) is located on the inside of the access riser for the pump.

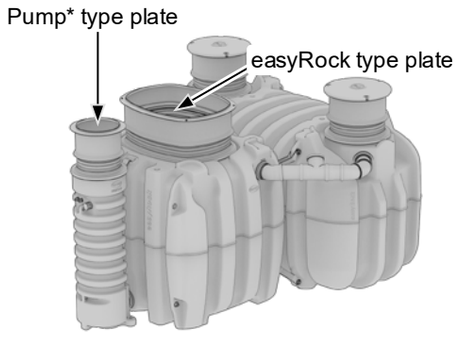


Fig. 2: Type plate and serial number positions
(optional accessory)*

CE
CSTB 0679
PIA 1739

GRAF SAS
45 route/rue d´Ernolsheim
67120 Dachstein-Gare
Frankreich
YY
DoP: ##

EN 12566-3:2005+A2:2013
COMPACT GRAVITY-FLOW
WASTEWATER TREATMENT SYSTEM
easyRock # PE
XXX m³/d
Serial number : xxxxxxxxxxx
HDPE

Fig. 3: Type plate easyRock

CE
PIA 1739

GRAF SAS
45 route/rue d´Ernolsheim
67120 Dachstein-Gare
Frankreich
YY
DoP: ##

EN 12050-2:2000
LIFTING STATION
Serial number : xxxxxxxxxxx
HDPE

Fig. 4: Pump type plate (optional accessory)

2.3 Requirements for the primary sedimentation tank

The primary sedimentation tank used must comply with DIN EN 12566-1. Volume and hydraulic efficiency requirements:

- The retention time is at least three days with a tank size of 450 litres / PE.
- The hydraulic efficiency of 21 g must be complied with.

When using Graf tanks, the recommended tank sizes are shown in the table.

PE	Pre-treatment	TU size *[PE]*
4	Carat 1,800	4
5	Carat 2,250	5
6	Carat 2,700	6
8	Carat 3,600	8

Tab. 1: Type range with Graf tanks

2.4 Description of function

Before the system can be used to treat wastewater, the primary sedimentation tank must be completely filled with fresh water.

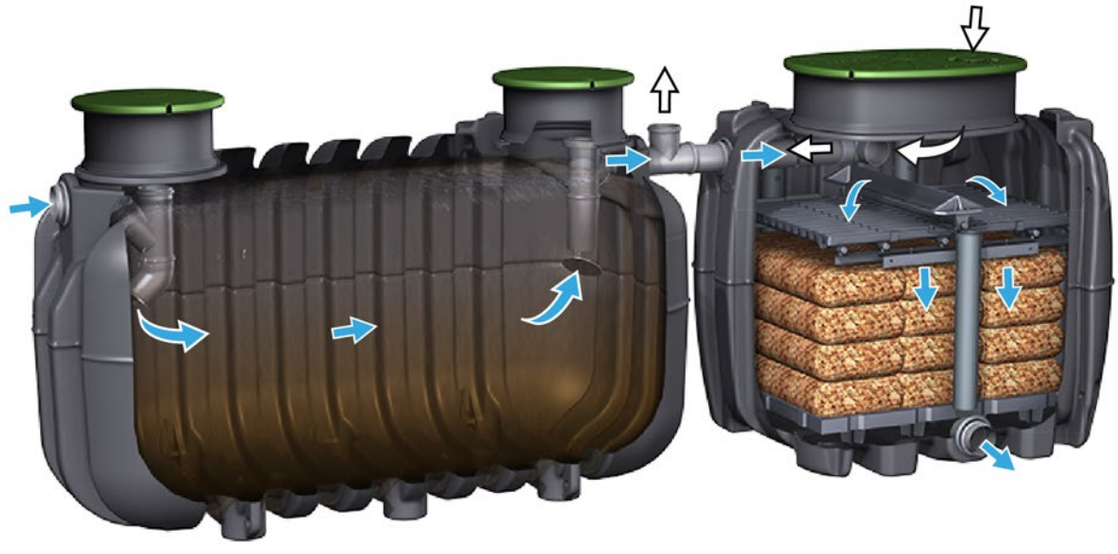


Fig. 5: Liquid flows (blue) and air flows (white) using the line configuration as an example

Stage 1: Primary sedimentation
Primary sedimentation is a mechanical treatment stage in which coarse matter and solids are removed.

Domestic wastewater flows through the wastewater inlet into the primary sedimentation tank. Fats, oils and other floating solids rise to the water surface, while settleable solids sink to the bottom and form

sludge. This sludge is anaerobically decomposed and mineralised during its months of storage. Organic coarse matter and solids floating on the surface of the water largely break down over time and also sink.

With further inflow into the system, wastewater largely cleaned of solids is displaced through the overflow into the treatment unit. Any remaining suspended solids are retained by a prefilter installed in the overflow.

Stage 2: Treatment unit
The actual aerobic microbiological treatment takes place in the treatment unit. The oxygen required for this is supplied by the aeration and ventilation system via a chimney effect.

The pretreated wastewater flowing from the overflow into the treatment unit alternately feeds two collection chambers, which are mounted on a tilting device above a distribution plate. As soon as one collection chamber is sufficiently filled with water, the chamber tilts downwards and distributes the collected water evenly over one half of the distribution plate. At the same time, the other collection chamber is raised and collects the inflowing water.

The water drips onto the GRAFROCK biofiltration media through openings in the bottom of the distribution plate. The GRAFROCK media are the carrier material for the microbiological biomass and filter the wastewater at the same time.

The treated wastewater collects at the bottom of the treatment unit and flows out through the outlet pipe allowing it to be reintroduced into the water cycle. In small wastewater treatment systems with a pump (original optional accessory), the water flows into the pump shaft before discharge. When the water level rises, a float switch at the bottom of the shaft switches on the submersible motor driven pump and the water is pumped through the raised outlet for reintroduction into the water cycle. A backflow valve in the pressure pipe prevents water from returning to the pump shaft from the raised outlet.

2.5 Scope of supply

2.5.1 Pack configuration

With the exception of the access risers and telescopic adapters, the system for 4–6 PE is supplied largely preassembled and on transport feet as a pack configuration. Alternatively, the system can also be set up as a line configuration.

Systems from a size of 8 PE are always supplied as individual tanks in a line configuration. However, the tanks can also be installed next to each other.

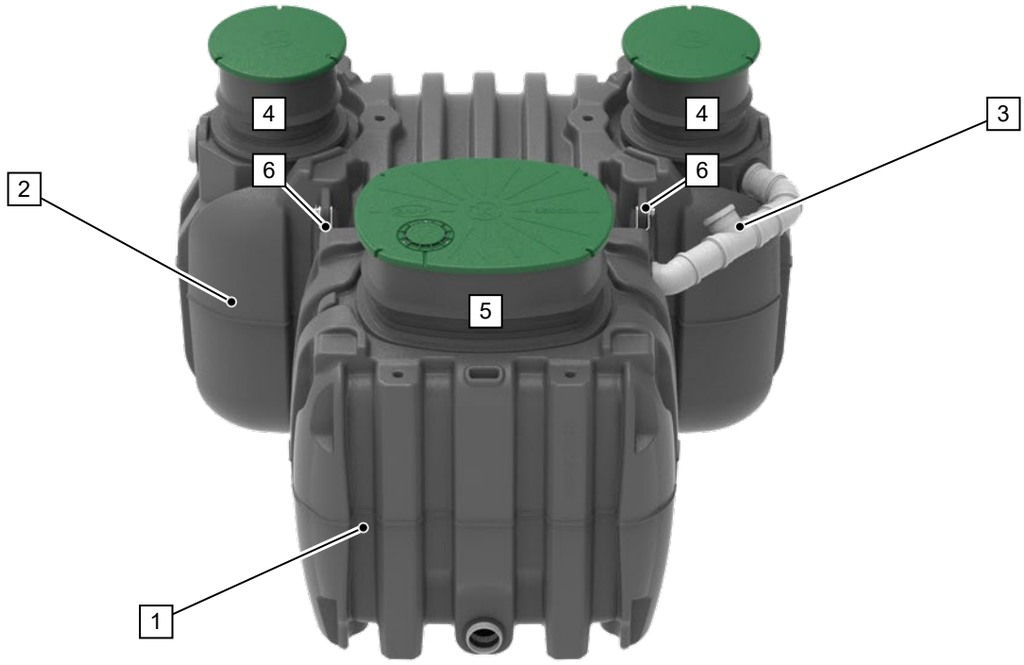


Fig. 6: Scope of supply for pack configuration easyRock small wastewater treatment system

1 Treatment unit[1]
2 Primary sedimentation tank[2]
3 Overflow system with branch fitting for ventilation pipe[3]
4 Access risers and telescopic adapters, primary sedimentation tank including seals[4]
5 Access riser and telescopic adapter, treatment unit including seals[5]
6 Tank couplings for pack configuration
7 Not shown: Disposable lifting slings with loops[3]
8 Not shown: Connection adapter[3] DN 110|DN 100

[1] Distribution system with sampling, treatment media, outlet connection fittings, shaft cover with aeration insert and transport feet fitted
[2] Connection fittings with inlet baffle, overflow baffle with prefilter, shaft cover and transport feet fitted
[3] Pre-assembled
[4] Packed in the treatment unit on delivery
[5] Packed on the side of the treatment unit on delivery

2.5.2 Line configuration

With the exception of the access risers and telescopic adapters, systems from a size of 8 PE are supplied largely preassembled and on transport feet as individual tanks for a line configuration. Alternatively, the system sizes for 4–6 PE can also be installed as a line configuration. However, the tanks can also be installed next to each other.

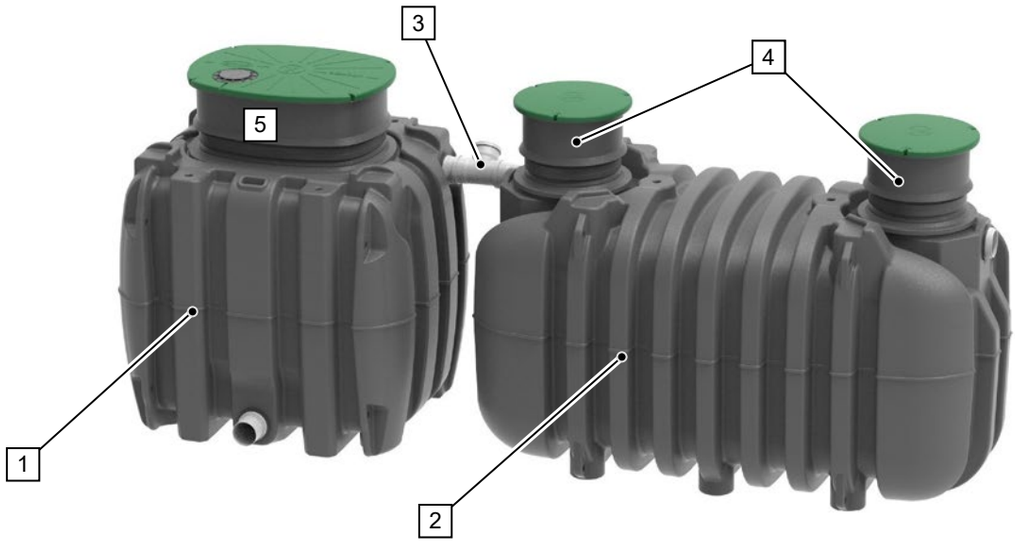


Fig. 7: Scope of supply for line configuration easyRock small wastewater treatment system

1 Treatment unit[1]
2 Primary sedimentation tank[2]
3 Overflow system with branch fitting for ventilation pipe
4 Access risers and telescopic adapters, primary sedimentation tank including seals[3]
5 Access riser and telescopic adapter, treatment unit including seals[4]
6 Not shown: Disposable lifting slings with loops[3]
7 Not shown: Connection adapter[3] DN 110|DN 100

[1] Distribution system with sampling, treatment media, outlet connection fittings, shaft cover with aeration insert and transport feet fitted
[2] Connection fittings with inlet baffle, overflow baffle with prefilter, shaft cover and transport feet fitted
[3] Packed in the treatment unit on delivery
[4] Packed on the side of the treatment unit on delivery

2.6 Required accessories

The accessories described below are required for the installation and operation of the small wastewater treatment system. The accessories are not included in the scope of supply and must be ordered separately.

Accessories	Description
Inflow/outflow pipes	Underground drainage pipes and fittings, DN 110
Ventilation pipes	Underground drainage pipes and fittings, DN 110

Tab. 2: Required accessories easyRock small wastewater treatment system

2.7 Optional accessories

Suitable accessories	Order no.	Description
easyRock anti-buoyancy device	169297	In case of presence or possible ingress of groundwater or stratum water into the pit. – 4 anchoring plates including installation materials (For line configuration 2 × required)
Pump for easyRock	169273	Incl. submersible motor driven pump with float switch and backflow alarm.
easyRock extension set	169271	Used to increase the earth covering by up to 180 mm / unit. – Shaft extensions for treatment unit and primary sedimentation tank (can be shortened by 60 | 120 mm)
Pump for easyRock extension set	169272	Used to increase the earth covering by up to 180 mm / unit. – Shaft extension for pump (can be shortened by 60 | 120 mm) – Extension raised outlet pump
Turbovent ventilation fan DN110 – 125, including reducer	169131	For installation in the ventilation pipe if ventilation is insufficient.
Pipe aerator DN 110, electric for small wastewater treatment systems	169138	For installation in the ventilation pipe if ventilation is insufficient.
easyRock aeration set, l=450 mm	169298	To raise the aeration inlet above ground level. – Pipe DN 110 black with filter and mushroom cap
Sampling shaft 400, suitable for pedestrian loading, inlet and outlet DN 110	169263	For taking samples of the treated wastewater in the outlet.

Tab. 3: Optional accessories easyRock small wastewater treatment system

2.8 Technical data

The information in this section relates to the standard scope of supply for the easyRock small wastewater treatment system. It also contains information about the pump (optional accessory).

2.8.1 Dimensions and weights

easyRock small wastewater treatment system		**Dimensions** *[mm]* **and weight** *[kg]*									
PE	**Volume[a)]** *[l]*	**LV**	**LB**	**Bges[b)]**	**BV**	**BB**	**LH[c)]**	**BH[c)]**	**H**	**Htot**	**Weight[d)]**
4	2	2	1	2	1	1	410	400	1	1–2	280
5	2	2	2	3	1	1	410	400	1	1–2	300
6	3	2	2	3	2	1	410	400	1	1–2	330
8	4	2	2	–	2	1	410	400	1	1–2	380

[a)] Volume of primary sedimentation tank [b)] Pack configuration [c)] Dimensions of pump (optional accessory) [d)] with pump + 25 kg

Tab. 4: Dimensions and weights easyRock small wastewater treatment system

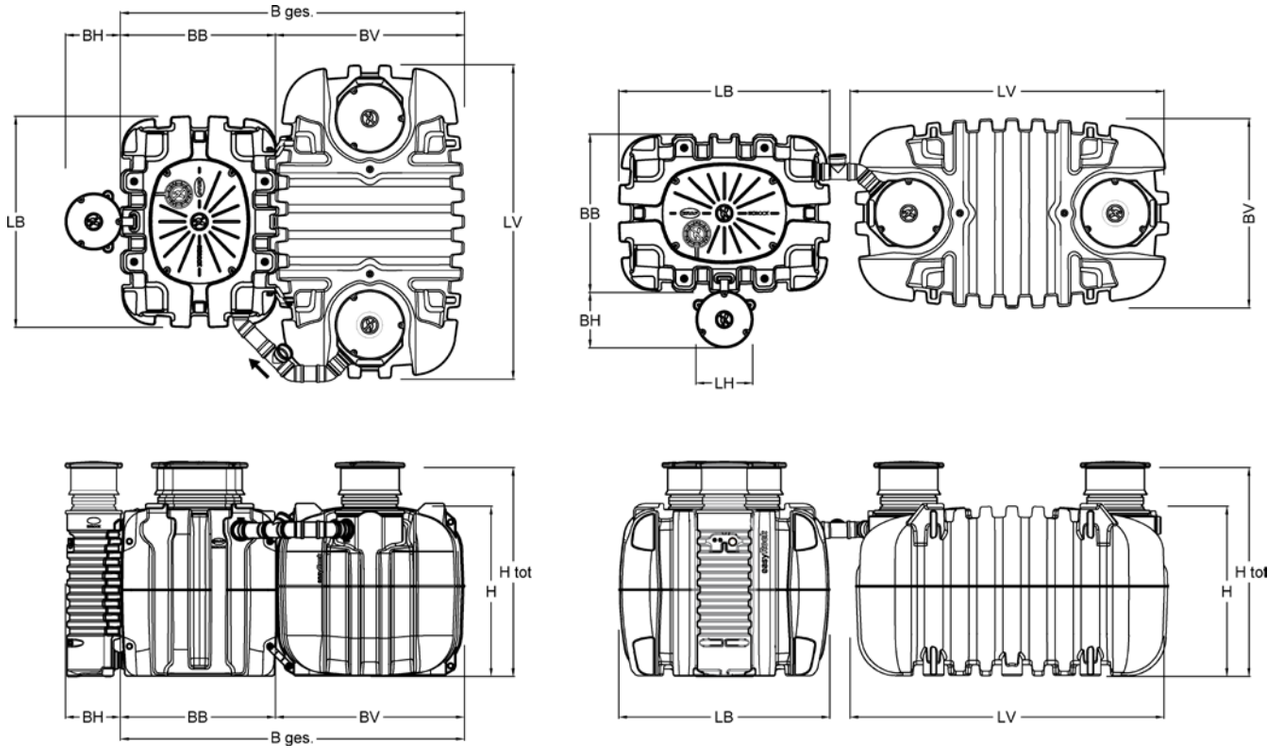


Fig. 8: Dimensions easyRock small wastewater treatment system, shown with pump (optional accessory) – pack configuration (left) and line configuration (right)

2.8.2 Connection dimensions

easyRock small wastewater treatment system		**Connection dimensions (pipe bottom measured from base of the pit)** *[mm]*		
PE	**Volume[a)]** *[l]*	Inlet primary sedimentation tank **R1** DN 110 | DN 100	Outlet treatment unit **R2** DN 110 | DN 100	Raised outlet pumping station[b)] **R3** DN 40
4	2	1 | 1	60 | 65	975
5	2	1 | 1	60 | 65	975
6	2,700	1 | 1	60 | 65	975
8	3,600	1 | 1	60 | 65	975

[a)] Volume of primary sedimentation tank [b)] Optional accessory

Tab. 5: Connection dimensions easyRock small wastewater treatment system

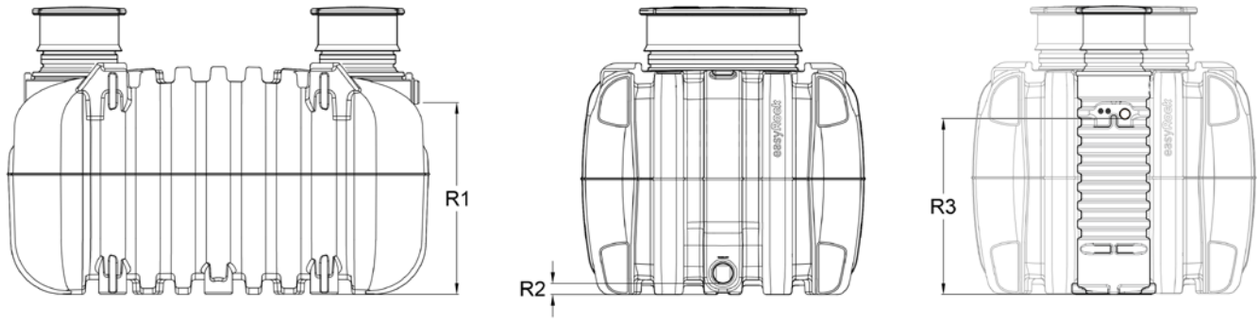


Fig. 9: Connection dimensions easyRock small wastewater treatment system, left primary sedimentation tank inlet, centre treatment unit outlet, right pump raised outlet (optional accessory)

2.8.3 Load values

easyRock small wastewater treatment system	**Max. surface load (traffic load)**	**Max earth covering** *[mm]*	**Max. immersion depth (in groundwater / stratum water)** *[mm]*
All systems	Ground surface max. 150 kg/m³	870	1,040

Tab. 6: Load values easyRock small wastewater treatment system

2.8.4 Performance characteristics

easyRock small wastewater treatment system		Performance characteristics	
PE	**Volume**[a] *[l]*	**Max. daily inflow** *[l / day]*	**Max. organic load** *[kg BOD_5 / day]*
4	2	600	24.00
5	2	750	30.00
6	3	900	36.00
8	4	1	48.00

[a] Volume of primary sedimentation tank

Tab. 7: Performance characteristics easyRock small wastewater treatment system

2.8.5 Energy consumption and emissions

The easyRock small wastewater treatment system does not require an energy source (tested energy consumption in accordance with EN 12566-3 = 0 kWh/d).

3 Safety

Despite all safety precautions, the product may nevertheless pose some degree of residual risk, particularly when handled incorrectly or negligently. Therefore, to protect yourself and others from hazards and to prevent damage to property or the environment due to improper use, read and follow the safety information and notes contained in these instructions.

Warning

Failure to heed the safety instructions may cause accidents and damage.

- The consequences can extend to serious, and even fatal injury and harm to health.

→ Read and follow both the safety instructions and the other instructions.

3.1 Safety symbols and signal words

The following safety symbols and signal words are used in these instructions:

Danger
This highlights imminent danger. Failure to observe this will cause death or grievous injury.

Warning
This highlights a potentially hazardous situation. Failure to observe this may cause death or grievous injury.

Caution
This highlights a potentially hazardous situation. Failure to observe this may cause slight or minor injury.

Important
This highlights a scenario that may cause pollution to the environment or damage to the product or nearby property.

Warning, electricity

Refer to the instructions
Read and observe the information in this document or other documents.

3.2 General safety instructions

3.2.1 Intended use

The easyRock small wastewater treatment system is intended exclusively for the treatment of biodegradable domestic wastewater and for returning the treated water to the natural water cycle. Domestic wastewater includes water from kitchens, washrooms, washbasins, bathrooms, toilets or similar installations, and contains faeces along with other substances typically found in bath, washing, sink, and mop water – such as soap, detergent and food scraps. The system must be operated only with Graf original treatment media or treatment media authorised by Graf.

The easyRock small wastewater treatment system is intended for underground installation. The system must not be installed above ground or in buildings unless the conditions for underground installation are created by enclosure and filling. The system must be operated with suitable shafts and shaft covers authorised by Graf. Structural modifications can seriously affect the stability and strength of the system. The intended use also includes the use of suitable accessories. The system may be used only for the purposes described in these instructions.

The easyRock small wastewater treatment system must not be used for the treatment of industrial, commercial or municipal wastewater or for the treatment of domestic wastewater for reuse as drinking or process water or for irrigation.

Under no circumstances may the following be drained into the system or introduced in any other way:

- Biocides and other toxic or biologically incompatible substances
- Chemicals and pharmaceuticals
- Mineral oils or solvents

Furthermore, the following must not be drained into the system:

- Rainwater from roofs and yards
- Infiltration water (e.g. drainage water)
- Liquid or solid residue from animal husbandry
- Commercial or agricultural wastewater, unless it is comparable to domestic wastewater
- Condensation water from heating or air conditioning systems, water from the backwashing of softening systems or 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
- Large quantities of grease or vegetable oils

CAUTION

- Failure to use the plant for its intended purpose may cause harm to health, pollution to the environment, and damage to property.

3.2.2 Safety measures

- **Keep shaft covers closed. Never leave open shaft covers unattended.**
  - Shaft covers may be opened only by competent persons for inspection and maintenance purposes. Harmful or highly flammable gases can form in wastewater treatment systems. There is a danger of persons or animals falling into the tank. This may result in serious injury, harm to health or drowning.
  - → Keep uninvolved persons – especially children – away from open shaft covers.
  - → The shaft covers must be closed in such a manner that they cannot be opened without tools. Before closing, make sure that there are no persons or animals in the tank.
  - → Observe the safety instructions for inspection and maintenance in *Part 3 of the instructions.*

- **Avoid all contact with wastewater.**
  - Contact with wastewater can cause infections and other health issues. Even treated wastewater can still contain germs or substances that are hazardous to health.
  - → Always keep shaft covers and access to the prefilter closed and secure them against being opened.
  - → Do not enter the area of an above-ground or otherwise accessible wastewater reintroduction point (e.g. soakaway / ditch) and secure against entry.
  - → Remove soiled or soaked clothing immediately after contact with wastewater. Rinse affected body parts thoroughly with clean water and then disinfect. Consult a doctor if you feel unwell.
  - → After eye contact, rinse eyes thoroughly under running water or with rinsing solution. Consult a specialist doctor.
  - → After swallowing wastewater, rinse the oral cavity thoroughly and drink plenty of water repeatedly. Consult a doctor.
  - → If wastewater gets into injuries, have wounds treated immediately by a doctor.

- **Do not light fires or smoke in the vicinity of the shaft covers and the inlets/outlets of the ventilation system.**
  - There is a risk of fire and explosion due to highly flammable gases that can be produced during biological processes in septic tanks.

- **Do not transport or place any substances hazardous to water or substances that must not enter the system near the shaft covers.**

3.3 Safety instructions for owners, operators and builders

Owners, operators and builders are responsible for correct installation and operation, including decommissioning and disposal. They are also responsible for ensuring observance of the safety instructions, specifications and other instructions in these instructions for use, and also of the locally applicable laws, standards, rules and regulations. Many countries may require a qualified professional to be contracted to maintain the unit.

3.3.1 Operator's obligations

The operator of the system must have the necessary expertise to operate the system or appoint a competent person to work on the system.[1]

In order to ensure the operating safety and proper operation of the system, the operator or the appointed person must:

- Carry out the prescribed regular checks and adjustments, and keep a log book.
- Have the prescribed regular maintenance work carried out by a qualified person.
- Immediately take the system out of operation and disconnect it from the power supply in the event of damage to electrical cables or equipment.
- Have operating faults or damage rectified or repaired immediately by a qualified person. This includes, in particular, adverse impacts such as odour nuisance or the formation of stagnant water that acts as a breeding ground for insects.
- Ensure that all safety markings/labels on the system are maintained in an easily legible condition at all times.

3.3.2 Personnel qualifications

Owners, operators and builders must make sure that the personnel responsible for installation, assembly, inspection and maintenance, as well as decommissioning and disposal, have the necessary skills or qualifications[2] for this work, and that all persons handling the product have the necessary competence[3] own. In addition, laws and regulations may apply with regard to the required skills or qualifications.

3.4 Safety instructions for transportation, storage, installation and assembly

The installation of the small wastewater treatment system, pipes and shafts must be supervised at all times by a person present on the construction site who is qualified in the construction, installation, retrofitting and renovation of small wastewater treatment systems and septic tanks.[4]

All transportation and installation work must be carried out by suitably skilled or qualified personnel. Local health and safety and accident prevention regulations must be observed.

[1] Competent persons are those who, on the basis of their training, knowledge or practical experience, are able to ensure that they carry out checks on small wastewater treatment systems in the proper manner.
[2] Qualified personnel are persons who have passed a recognised examination to obtain the necessary specialist knowledge.
[3] Competent persons are those who, on the basis of their training, knowledge or practical experience, are able to ensure that they carry out checks on small wastewater treatment systems in the proper manner.
[4] Qualified personnel are persons who have passed a recognised examination to obtain the necessary specialist knowledge.

There is generally an increased risk of accidents on construction sites and when handling heavy and large loads. Accidents involving lifting equipment and construction machinery can result in serious injury or death. If excavations are not carried out correctly, people can be buried by slipping or collapsing pit walls.

3.4.1 Safety measures

- **Wear personal protective equipment (PPE).**
  - PPE (safety shoes, protective gloves, goggles, helmet, etc.) protects the wearer against injury and harm to health.
  - → Whenever necessary, wear the prescribed protective equipment.
  - → Do not use damaged or defective protective equipment, which must be replaced immediately with fully functional equivalents.

- **Use only suitable and intact load handling equipment and lifting gear with sufficient load capacity.**
  - Unsuitable or damaged load handling equipment and slings can tear or break and the load could fall.
  - → Do not use worn or damaged load handling equipment.

- **Secure lifting and transportation routes.**
  - Approaching persons can be run over or rammed into when the system is being transported and moved. Collisions with objects or buildings can severely damage the system.
  - → Keep uninvolved persons away from the danger zone.
  - → If visibility of the lifting or transportation route is poor, have a second person instruct you.

- **Ensure the stability of the excavated pit.**
  - Sliding earth masses can bury people. This can result in death by suffocation or serious injury.
  - → Secure the walls of the excavated pit against slipping by sloping or shoring.
  - → Take the soil and water conditions into account when selecting and implementing the securing method. If necessary, verify the stability by calculation.

- **Keep the pit free of water.**
  - Penetrating groundwater or stratum groundwater can flood the pit. People could drown.
  - → Reliably pump out groundwater or stratum water.

- **Work on the electrical system and connection to the power supply may be carried out only by qualified electricians.**
  - Danger of electric shock. An electric shock can cause serious burns and life-threatening injury.

3.5 Safety instructions for commissioning, inspection and maintenance, decommissioning and disposal

All work for commissioning, inspection and maintenance as well as decommissioning and disposal of the system must be carried out by suitably competent[1] or qualified[2] personnel. Many countries may require a qualified professional to be contracted to maintain the unit. Local health and safety and accident prevention regulations must be observed, particularly when working in tanks and confined spaces.

When working with wastewater or where contact with wastewater may occur, there is always an increased health risk from pathogenic germs or substances.

In special cases, it may be necessary for people to enter the tank. As well as making access and escape routes more difficult, working in the tank can be hazardous due to lack of oxygen and harmful or highly flammable gases. If the air supply in the tank is not guaranteed or if gases are likely to be present in the tank, do not enter the tank until a safe atmosphere is guaranteed.

3.5.1 Safety measures

- **Do not consume any food or drink when working on the system.**
  - Food that comes into contact with microbes may carry and cause infection.

- **Wear personal protective equipment (PPE).**
  - PPE (coveralls, protective gloves, goggles, safety shoes, etc.) protects the wearer against harm to health.
  - → Whenever necessary, wear the prescribed protective equipment.
  - → Do not use damaged or defective protective equipment, which must be replaced immediately with fully functional equivalents.

- **Shutting down the system's installations and equipment.**
  - Equipment may start to operate unexpectedly. Damaged cables can cause electric shocks.
  - → Before all work on the system, shut it down completely, including all of its installations, and secure it against reactivation.
  - → Disconnect the electrical installations from their power supplies.

- **Work on the electrical system and connection to the power supply may be carried out only by qualified electricians.**
  - Danger of electric shock. An electric shock can cause serious burns and life-threatening injury.

- **Vent the tank sufficiently before working on open shafts.**
  - Harmful or highly flammable gases can form in wastewater treatment systems.
  - → After opening the shaft covers, leave the area and wait at least 5 minutes to allow lighter-than-air gases to escape.

[1] Competent persons are those who, on the basis of their training, knowledge or practical experience, are able to ensure that they carry out checks on small wastewater treatment systems in the proper manner.
[2] Qualified personnel are persons who have passed a recognised examination to obtain the necessary specialist knowledge.

3.5.1.1 Safety measures for work inside tanks

- **Verify that work inside the tank is necessary.**
  - When working in tanks, there may be an increased risk due to oxygen deficiency, harmful gases and difficult escape routes.
  - → Always consider first whether this work can be performed from outside (e.g. inspection using a camera).

- **Assign a second person to supervise all work.**
  - This second person must remain at the access point. They must remain in constant contact with the person in the tank and be in a position to fetch assistance immediately.
  - → Never enter the tank without this second, supervising person.

- **Empty tanks completely.**
  - An accident victim can also drown in shallow depths or swallow wastewater.
  - → Never get into a tank that is even partially full.

- **Provide a supply of healthy air to the tank.**
  - Harmful or highly flammable gases can form in wastewater treatment systems.
  - → Before being accessed, the tank must first be vented adequately to clear it of any gases.
  - → If adequate cross or diagonal venting (chimney effect) cannot be ensured, a supply of air must be provided with equipment.
  - → Whenever necessary, measure and monitor constantly the air quality.

- **Ensure safe access and provide an escape route.**
  - → Use only suitable equipment (e.g. a ladder) to access the tank.
  - → Make sure that the escape route remains unobstructed.

3.5.1.2 In the event of an accident in the tank

- **If an accident victim is unconscious, do not under any circumstances attempt to climb in to rescue them.**
  - There is danger of death from asphyxiation or noxious gases.
  - → Call the emergency services and follow their instructions.
  - → While you are waiting, vent the tank from outside, using e.g. a fan or similar.

4 Delivery, transportation and storage

4.1 Delivery

The access road must be adequately surfaced and continuously passable for lorries with a clearance height of 4 m. Delivery vehicles are often not equipped with lifting gear. Establish the requirements and responsibilities for unloading, transportation to the installation site and moving the system into the excavated pit as well as the provision of suitable lifting equipment with your local dealer.

Inspection of goods
Check the goods for damage and completeness upon receipt or after unloading. Later complaints will not be considered. Do not accept damaged goods.

4.2 Unloading and transporting the system

Requirements

- Unloading and transportation tasks must be carried out by competent persons. Take the dimensions and weight of the system into account.
- Before unloading and transporting the system, familiarise yourself with the safety instructions in *Section 3.4*.
- Read and follow the instructions given below.
- When lifting and transporting the system, make sure that no persons are endangered.
- Avoid bumping or hitting the system under all circumstances.

Loading and transportation instructions

- Never tip the system or the tanks off the vehicle or allow them to slide down a ramp (e.g. made of wooden planks).
- Separated tanks should only be transported individually.
  („*Separate the primary sedimentation tank and treatment unit*“, see *Section 5.3.2.1*)

Unloading/transporting with a forklift truck

- The transport feet must be fitted to the tanks for unloading and transporting with a forklift truck.
- Only pick up the system or the tanks in the middle between the transport feet.
  ⓘ The system or the tanks must rest completely on the forks of the forklift truck.

Unloading/transporting with a crane or excavator

- Only the supplied disposable lifting slings may be used to lift the system/tanks.
- As a replacement, e.g. if lost or damaged, use only slings that at least meet the specifications in *Tab. 8*. Use only slings with the specified lengths.

1. Undo the screws on the shaft cover on the treatment unit.
2. Remove the shaft cover and set aside.
3. Attach the lifting slings to the attachment points provided at the top of the tanks.
   ⓘ Take note of the attachment points and number of slings (see *Fig. 10 – 12* and *Tab. 8*).

4. Lift the system by the lifting slings using a load hook.
   ⓘ The slings must be evenly tensioned and the system must be horizontally level.
5. If the system will not be assembled and installed immediately after transportation, put the shaft cover back on the shaft and fasten it in place with the screws.

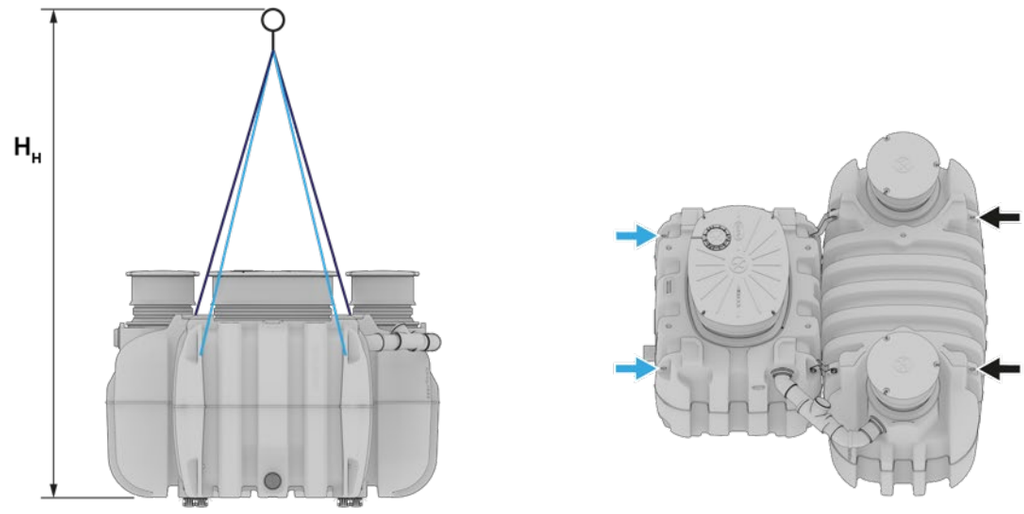


Fig. 10: Attachment points and slings for pack configuration

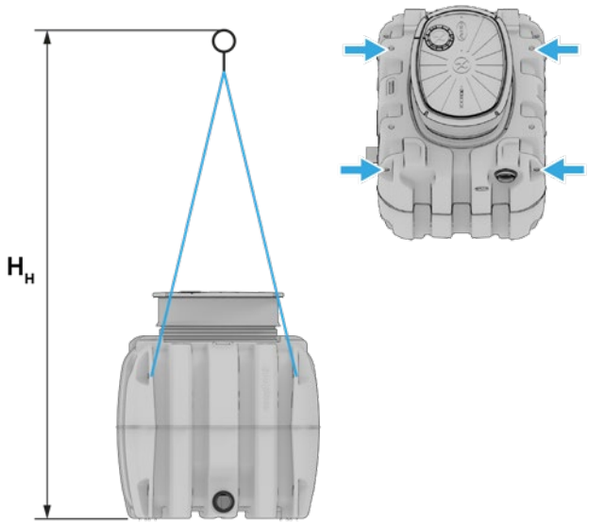


Fig. 11: Attachment point and slings, treatment unit

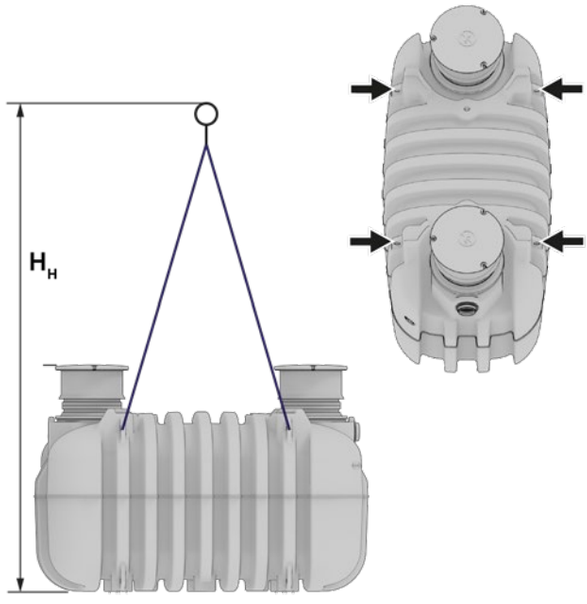


Fig. 12: Attachment points and slings, primary sedimentation tank

easyRock small wastewater treatment system			Lifting slings			
PE	**Configuration**	**Volume[a] *[l]***	**Length *[mm]* + quantity**	**Lifting height (H_H) *[mm]***	**Load capacity (WLL) *[t]***	**Safety factor (SF)**
4	Pack	2	4 × 3	3	5.0	≥ 5:1
4	Line	2	4 × 3[b] 4 × 3[c]	3	5.0	≥ 5:1
5	Pack	2	4 × 3	3,200	5.0	≥ 5:1
5	Line	2	4 × 3[b] 4 × 3[c]	3,200	5.0	≥ 5:1
6	Pack	3	4 × 3	3	5.0	≥ 5:1
6	Line	3	4 × 3[b] 4 × 3[c]	3	5.0	≥ 5:1
8	Line	4	4 × 3[b] 4 × 3[c]	3	5.0	≥ 5:1

[a] Volume of primary sedimentation tank [b] Primary sedimentation tank [c] Treatment unit

Tab. 8: Requirements for slings

4.3 Storing the system

If not stored correctly, the system may be damaged by point loads. Observe the following instructions when storing the system.

- Store the system only on flat, level surfaces.
- Only set the system down on the underside of the tanks or on the transport feet.
- Store the system only with the covers and connections closed.
- Do not place any loads on the system.
- Secure the system against strong wind loads.
- Protect the system from strong sunlight during longer storage periods.

5 Installation and assembly

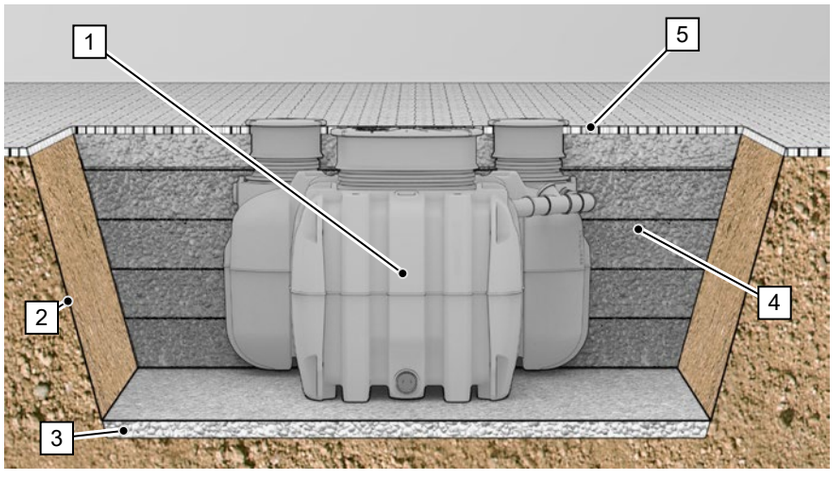
Requirements

- The installation of the small wastewater treatment system, pipes and shafts must be supervised at all times by a person present on the construction site who is qualified in the construction, installation, retrofitting and renovation of small wastewater treatment systems and septic tanks. [1]
- Installation and assembly must be planned and carried out by competent persons.
- Familiarise yourself with the safety instructions in *Section 3* before installation and assembly.
- Read and follow the installation specifications and instructions given below. Failure to follow these instructions may endanger persons, pose a risk the environment, and cause damage to the tank or neighbouring infrastructure.

5.1 Overview

The system can be installed in either a pack configuration (tanks mechanically joined) or a line configuration (tanks separated) (see also *section 5.3 "Choose installation configuration"*).

The system or the tanks [1] are placed into an excavated pit [2] on a bedding layer [3]. When installed in damp soil (groundwater / stratum water), plastic anchoring plates are fitted to the lower sides of the tanks as an anti-buoyancy device. Then the connecting pipes are fitted and, in the case of a line configuration, the overflow pipes are fitted. Finally, the pit is filled with suitable backfill material [4] and the covering layer [5] is installed.



[1] easyRock small wastewater treatment system (pack configuration)
[2] Pit
[3] Bedding layer
[4] Backfill material
[5] Covering layer

Fig. 13: Recommended installation – site cross-section

[1] Qualified personnel are persons who have passed a recognised examination to obtain the necessary specialist knowledge.

5.2 Installation specifications

5.2.1 Conditions at the installation site

In addition to the general specifications for executing and backfilling the excavation, the installation position and installation depth depend on:

- The soil and water conditions at the installation site
- The intended use of the surface
- Different environmental conditions at the installation site

Under certain circumstances, structural measures may also be necessary to create suitable installation conditions.

Important!

Establish before installation:

→ Structural suitability of the soil
  – Mechanical properties of the soil
  – Maximum groundwater levels and penetration of stratum water
  – Drainage of the subsoil
  – Frost line depth (for year-round use)

→ Types of loading present, e.g. traffic loads

→ Nature of the terrain and surrounding area

→ Nearby buildings, traffic areas and trees

A soil survey should be obtained from the relevant authority to determine the physical properties of the soil.

5.2.2 Installation location: Distances

Special requirements apply for installation near to buildings, traffic areas, elevated ground and trees as well as for installation on slopes.

5.2.2.1 Distance from buildings

In order to prevent damage to the system or neighbouring structures:

- The system must be installed at a distance ≥ 1 m from the building foundation.
- A distance of ≥ 50 cm must be maintained between the slope face of the excavated pit and the structure's load zone along the entire length of the slope face.

If the angles of the slope face and/or the load zone are not known, we recommend assuming an angle of 45° in each case.

Minimum distances from buildings	
System [1] <-> Building foundation [2]	[A] ≥ 1 m
Slope face [3] <-> Load zone [4]	[B] ≥ 50 cm

Tab. 9: Distances from buildings

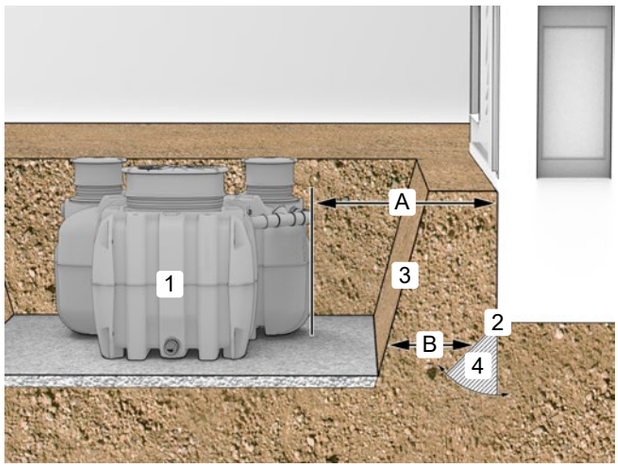


Fig. 14: Installation close to buildings

[1] easyRock small wastewater treatment system
[2] Building foundation
[3] Slope face
[4] Load zone
[A] Distance from the building's foundation
[B] Distance from load zone

5.2.2.2 Distance from elevated ground (slopes, hills, embankments, ...)

Elevated ground with a slope gradient of > 5° generates additional horizontal earth pressure in the neighbouring ground. To prevent damage to the system or landslides, the system must be installed at a minimum distance of ≥ 5 m.

If the system is installed at a distance of < 5 m, a retaining wall must be built between the system and the elevated ground.

The retaining wall must be calculated and approved by a qualified planning firm. For more information on the requirements for a retaining wall, see *Section 5.2.7.1*.

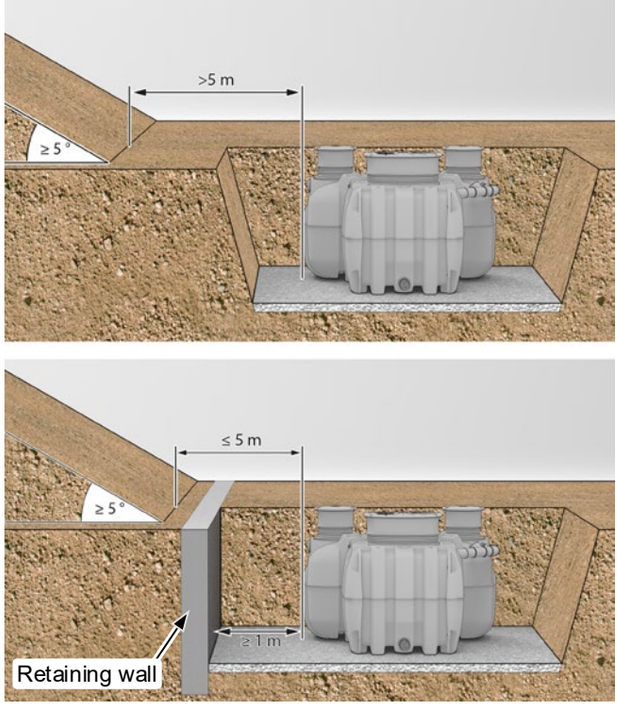


Fig. 15: Distance from elevated ground

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5.2.2.3 Distance from trees and shrubs

To prevent damage to the system caused by roots, the system must be installed at a distance of ≥ 3 m from trees or other woody plants with significant roots. The distance must also be at least equal to the expected tree crown diameter.

In addition, tree protection laws and regulations may apply at the installation site.

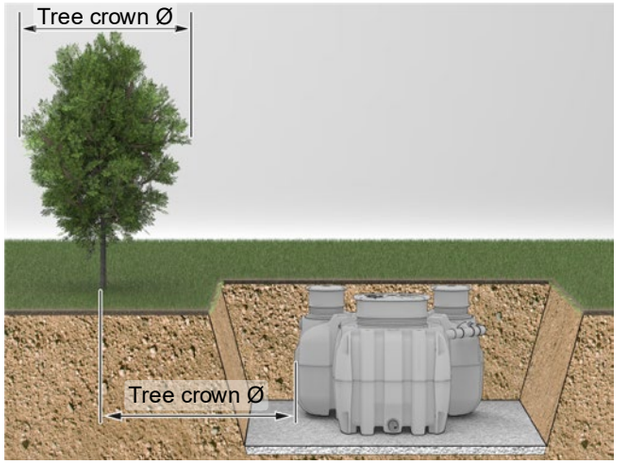


Fig. 16: Distance from trees

5.2.2.4 Distance from traffic areas and neighbouring properties

If the system is installed next to areas that can be driven on by vehicles, or close to neighbouring properties, the distance between the system and these areas must be at least equal to the installation depth.

If the system is to be installed at a lesser distance, its stability must be calculated and approved by a qualified planning firm. If necessary, stability must be ensured by suitable structural measures (see also *Section 5.2.7*).

Neighbouring areas must not be affected in any way or restricted in their future use.

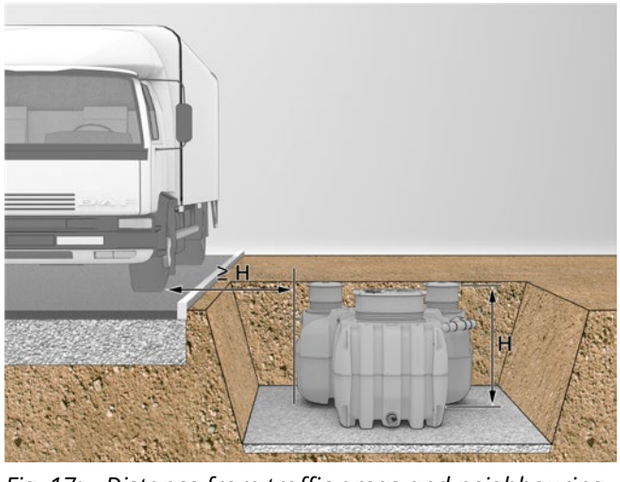


Fig. 17: Distance from traffic areas and neighbouring properties

5.2.2.5 Distance from other underground tanks

If other containers (e.g. tanks) will be installed or have already been installed in the vicinity of the system, a minimum distance of ≥ 20 cm must be maintained between the tanks.

5.2.2.6 Distance from water catchment systems

The minimum distances from water catchment systems depend on the locally applicable regulations and ordinances. In particular, different specifications may also apply for the distance from the system and from the reintroduction point for the treated wastewater. Please contact the local authorities. Usually, the minimum distance is checked as part of the approval process.

5.2.3 Requirements for the excavated pit

5.2.3.1 Soil characteristics: installation situations

During planning and installation, the specifications for the respective soil and water conditions at the installation site must be observed. A basic distinction is made between the installation situations described in *Tab. 10*.

Installation situation	Soil characteristics
Dry soil	– Good load-bearing and dry soil – No ingress of groundwater or stratum water at or above the level of the base of the pit.
Damp soil	– Presence or possible ingress of groundwater or stratum water at or above the level of the base of the pit.

Tab. 10: Soil and water conditions in different installation situations

5.2.3.2 Stability

The walls of the excavated pit must be sloped, shored or otherwise secured in such a way that they are stable during the entire construction period and no persons are endangered by slipping or falling earth. The pit must be kept free of water during the entire installation period.

5.2.3.3 Load-bearing capacity

The ground must have sufficient load-bearing capacity to permanently prevent the system from subsequently settling. If necessary, the load-bearing capacity must be established by compaction or a suitable substructure.

5.2.3.4 Soil permeability and water level

The soil should be free of groundwater and sufficiently permeable so that no water can collect in the excavation pit even during heavy or prolonged rainfall. The system must not be installed in areas at risk of flooding.

Damp soil: presence or possible ingress of groundwater or stratum water
If the soil is poorly permeable or impermeable to water, or if groundwater can rise into the excavated pit, the system must be installed with an anti-buoyancy device (optional accessory) to prevent it from floating (see also *Section 5.4.9*).

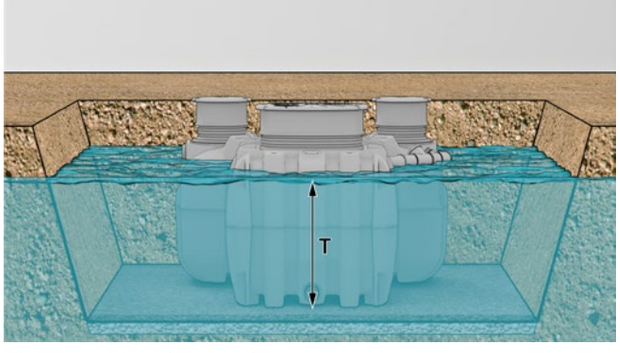


Fig. 18: Max. immersion depth

The system may be immersed in water up to the maximum permissible immersion depth (D). At higher water levels, the system may become deformed or flooded. Penetrating groundwater or stratum water must be drained off (e.g. using a ring drain and, if necessary, a pumping system) so that the tank is never immersed deeper than the permissible immersion depth.

easyRock small wastewater treatment system	Max. immersion depth (D)
All systems	104.00 m

Tab. 11: Max. immersion depth in groundwater / stratum water

If installed in damp soil, the outlet for the treated wastewater must be raised above the maximum expected groundwater level using a pumping system.

5.2.3.5 Space requirements

The base area of the pit must be excavated in such a way as to ensure compliance with the locally applicable regulations for the minimum working space widths in pits and trenches on all sides of the system. In most countries, a minimum working space width of 50 cm applies (60 cm in the case of pit shoring).

The width of the slopes or pit shoring must be added to the total excavation area.

If the system is installed in damp soil, allow for the size of the anchoring plates plus approx. 20 cm of free space in both directions to ensure proper positioning.

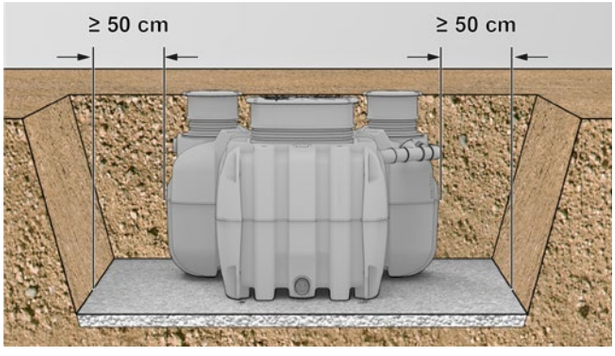


Fig. 19: Working space in the pit

5.2.3.6 Excavation depth / installation depth

The depth of the pit is determined by:

- The height of the bedding layer [1] (10 cm–30 cm)[1]
- The height of the primary sedimentation tank / treatment unit up to the tank shoulder [2]
- The height of the required covering layer [3]

When calculating the installation depth, consider the pipe invert levels for the connecting pipes. If the system is to be operated all year round, all components carrying water must be installed below the frost line.

For the covering layer, refer to the values and specifications for permissible cover heights (see *Section 5.2.5*).

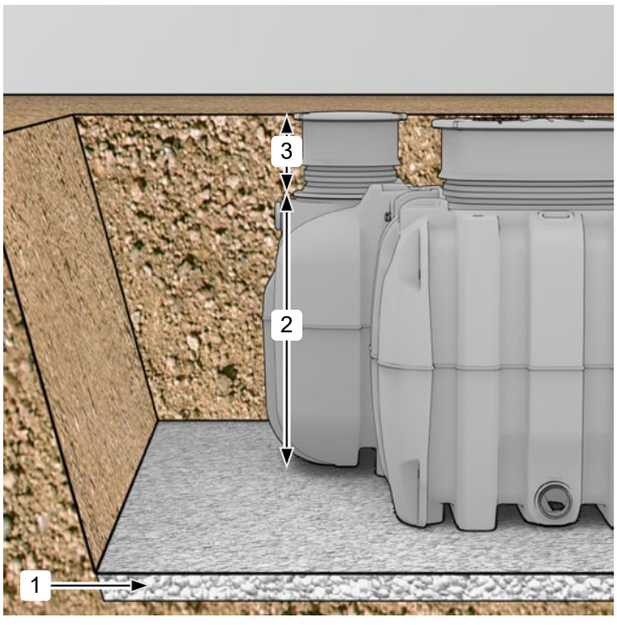


Fig. 20: Excavation depth / installation depth

[1] Bedding layer
[2] Height of primary sedimentation tank / treatment unit
[3] Cover height

[1] Depending on the installation situation (see also *Section 5.2.3.1*)

5.2.4 Bedding and backfilling – materials and execution

The system may be installed using only suitable bedding and backfill materials. Unsuitable or improperly installed bedding and backfill materials may cause damage to the system or cause it to float, and cavities may form.

Bedding		Filling	
Material	**Height**	**Material**	**Backfill area**
Rounded gravel, grain 8/16 mm	10–30 cm	Rounded gravel, grain 8/16 mm	≥ 50 cm at the side of the tanks ≥ 20 cm on top of the tanks ≥ 40 cm at the side of access shafts

Tab. 12: Materials and layer thicknesses for bedding and backfill

Excavated soil can be used for the top 20 cm of the covering layer if it meets the following requirements.

The excavated soil must:

- Be free of sharp or pointed parts and objects
- Be well and evenly permeable to water
- Be well compactable

Cohesive soils (silt, clay, etc.) must not be used for the covering layer.

5.2.5 Permissible cover heights

To ensure the stability and breakage resistance of the system, the cover height above the tops of the tanks must be between 20 cm and 87 cm.

Using extension sets[1] the cover height can be increased by up to 18 cm per set. A maximum of 3 extension sets may be installed. The maximum cover height of 87 cm must not be exceeded.

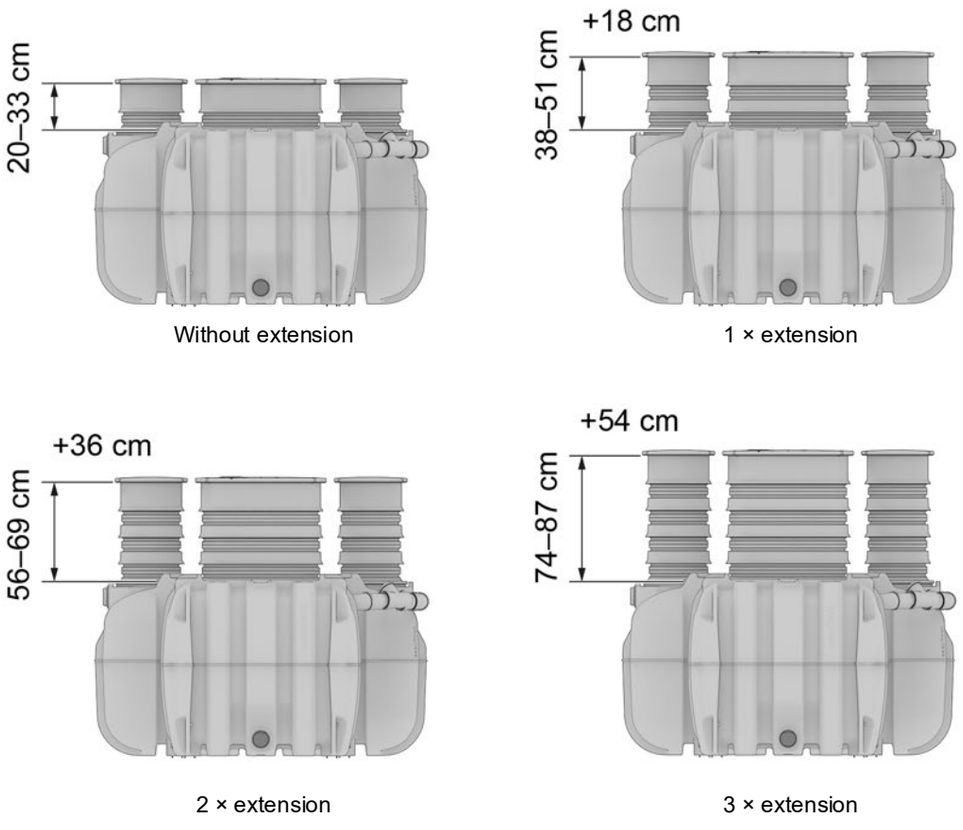


Fig. 21: Cover heights

* Dimensions with telescopic adapter fully pushed in, max. + 15 cm telescopic

[1] Optional accessory

Adjusting the cover height

Using the telescopic adapters, the shaft heights can be extended by a maximum of 15 cm and aligned exactly flush with ground level.

To adjust the cover height, the shaft extensions (optional accessory) can be shortened by 6 cm using a saw or cutting disc.

- Shorten the shaft extensions on the topmost rib at the notch provided for this purpose.

Important!
Never shorten the shafts. Shorten the shaft extensions only at the topmost rib. Otherwise it will not be possible to fit the telescopic adapters.

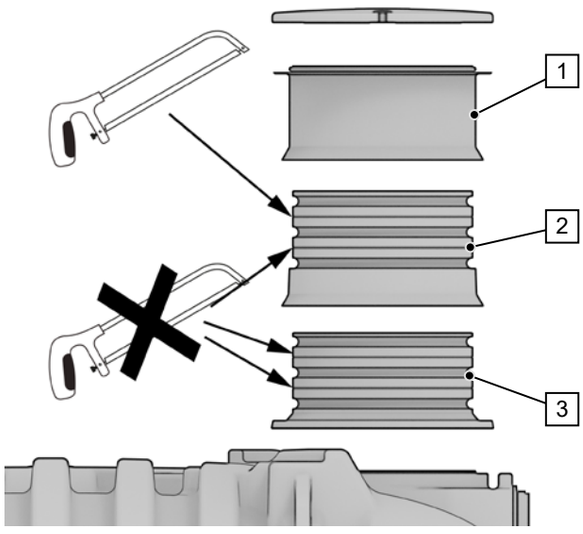


Fig. 22: Adjusting the shaft extensions (e.g. primary sedimentation tank shaft)

1 Telescopic adapter
2 Shaft extension[1]
3 Access riser

5.2.6 Permissible surface load (traffic load)

The system is not designed to support vehicle or other heavy loads, and may be installed only under surfaces that cannot be driven on by vehicles. If necessary, driving on them must be prevented by structural measures. The area above the system may not be used as a storage area.

5.2.7 Special structural measures

5.2.7.1 Retaining wall

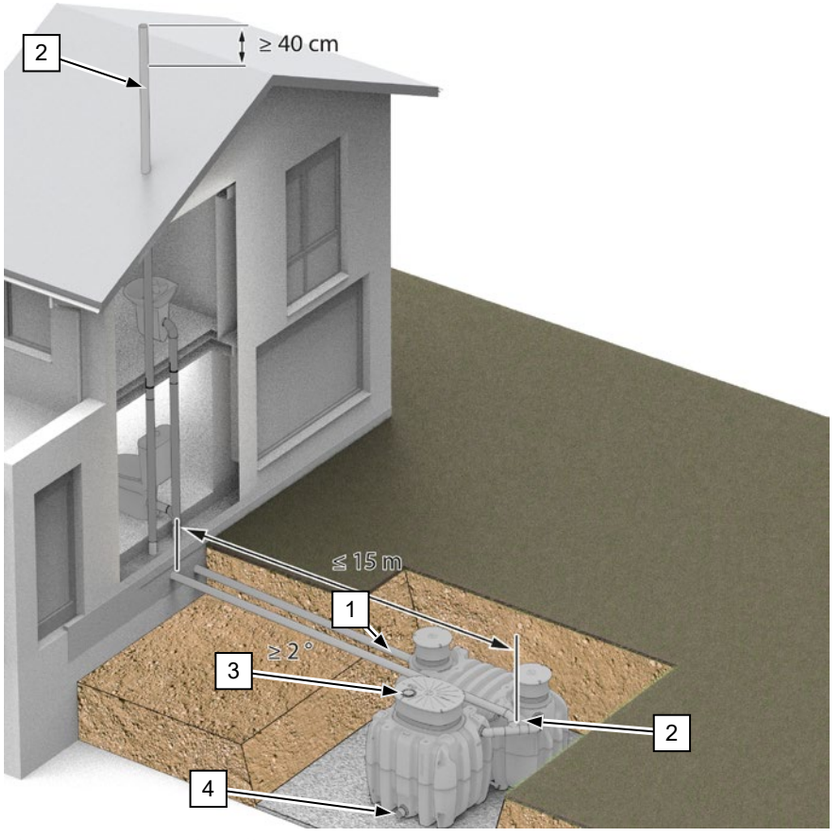
If the minimum distance between the system and elevated ground or traffic areas is not met, a retaining wall made of reinforced concrete must be built to secure the adjacent terrain and prevent damage to the system.

Requirements for a retaining wall

- The characteristics of the retaining wall (positioning, reinforcement, dimensions, thickness, etc.) must be calculated and approved by a qualified planning firm.
- The retaining wall must be built at a distance of ≥ 1 m from the system and must extend beyond the dimensions of the system by at least 50 cm in all directions (vertically and horizontally).

[1] Optional accessory

5.2.8 Connections and pipes



1 Wastewater inlet
2 Ventilation
3 Aeration
4 Outlet

Fig. 23: Connection diagram

5.2.8.1 Connection dimensions

The connection openings for inlet, outlet and ventilation on the system tank are designed ex works for DN 110 underground drainage pipes. Connection adapters for DN 100 pipes are included in the scope of supply.

The raised outlet from systems with a pump is equipped with a connection fitting with a Ø 1½" external thread for the subsequent pipework.

5.2.8.2 Wastewater pipes

The inlet pipe and the discharge pipe must be laid independently of each other and must not be connected to each other or to other pipes. The inlet and discharge pipes must be laid as straight as possible and with a slope ≥ 2 %. If the system is to be used at temperatures ≤ 0 °C, all pipes carrying water must be laid at a depth below the frost line. It must be possible to drain and block off pipes that are not laid below the frost line.

Inlet
To avoid blockages caused by fatty deposits, the inlet pipe between the wastewater discharge point from the building and the system's inlet connection should be a maximum of 10 m long. For inlet pipes > 10 m, we recommend installing a grease separator.

Outlet
To prevent backflow into the system, the outlet of the discharge pipe must be above the highest possible groundwater level. If necessary, the treated wastewater must be raised up to the outlet point by means of a pump (see also *Section 5.2.3.4*).

5.2.8.3 Aeration system

The aeration and ventilation pipes must be laid independently of each other and must not be connected to each other or to other pipes.

Aeration
Aeration occurs through the aeration opening in the shaft cover of the treatment unit. If necessary, the aeration inlet can be raised using an aeration set (optional accessory). The aeration air inlet must remain unobstructed by vegetation, snow or other blockages.

Ventilation
The ventilation pipe may be connected only to the branch fitting in the overflow system between the primary sedimentation tank and the treatment unit, and may be laid only to a maximum of 15 m from the branch fitting. The ventilation pipe must run as straight as possible with a slope ≥ 2 % and then lead upwards into a vertical riser. Only elbows with an angle ≤ 45° may be used. For pipe lengths > 15 m to the riser, or a pipe run with bends or elbows > 45°, it may be necessary to install a technical ventilation system. The height difference between the air inlet and the air outlet must be at least 4 m. The outlet opening must be positioned at least 40 cm above the roof ridge or other obstacles (e.g. trees) and be fitted with a rain cap or a ventilation fan (optional accessory). There must be no obstructions, other vents or flues (e.g. chimney) or openings (e.g. windows) within a radius of 1 m from the air outlet.

5.2.8.4 Electrical wiring

The electrical wiring for the pump (optional accessory) must be routed through an empty pipe in the ground or otherwise protected.

5.2.9 Sampling capability

In order to be able to check the system's treatment performance, it must be possible to take samples from the treated wastewater outflow. In many countries, a sampling capability is mandatory.

The treatment unit in easyRock systems is equipped with a sampling device. If the system is installed with a pump (optional accessory), samples can also be taken from the bottom of the pump. Check whether the sampling capabilities conform to local regulations.

It may be necessary to install a sampling shaft[1] in the discharge pipe between the system and the reintroduction point. The sampling shaft must conform to local regulations.

5.3 Choose installation configuration

Systems from a size of 8 PE are always supplied as individual tanks in a line configuration. However, the tanks can also be installed next to each other.

[1] available as an accessory

5.3.1 Pack configuration

The system is delivered largely preassembled ex works in a pack configuration. In this configuration, the tanks are mechanically joined at the sides using metal couplings at the upper and lower attachment points, and the overflow and ventilation system is pre-installed. In this configuration, the system can be lowered directly into the pit.

Fig. 24: easyRock small wastewater treatment system Pack configuration with pump (optional accessory)

5.3.2 Line configuration

For alternative installation scenarios, the system can also be installed in a line configuration. For installation in a line configuration, the primary sedimentation tank and the treatment unit must first be separated from each other and the pipes of the overflow and ventilation system must be removed. The tanks can then be placed separately in the pit and positioned individually.

Fig. 25: easyRock small wastewater treatment system line configuration (without pump)

5.3.2.1 Separate the primary sedimentation tank and treatment unit

- On delivery, the access riser and the telescopic adapter for the treatment unit are packed on the side of the treatment unit. Remove and set aside before separating the tanks.

Procedure

The tank couplings are fitted to the top and bottom attachment points on the facing sides of the primary sedimentation tank and treatment unit.

1. Pull the inner spring cotter pin out of the coupling tube at each of the upper attachment points on the treatment unit.
2. Pull the coupling tubes outwards from the coupling link.
3. Pull the outer spring cotter pin out of the coupling tube at each of the lower attachment points on the treatment unit.
4. Push the coupling tubes inwards out of the coupling link.
5. Remove the DN 110 pipes of the overflow and ventilation system from the connection fittings on the primary sedimentation tank and treatment unit, and store them safely for later reconnection.
6. Move the tanks far enough apart that all spring cotter pins at the lower attachment points on the primary sedimentation tank can be reached.
7. Pull all spring cotter pins out of the coupling tubes on the primary sedimentation tank.
8. Pull the coupling tubes completely out of the top and bottom attachment points on the primary sedimentation tank and the coupling links.
9. Collect the parts of the tank couplings and send them for recycling.

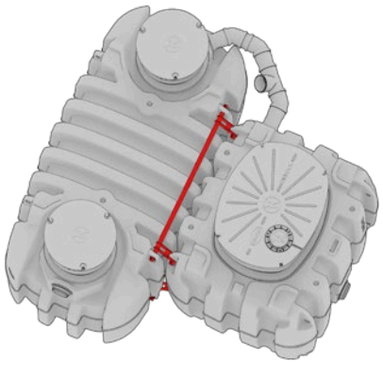


Fig. 26: Coupling tube from above

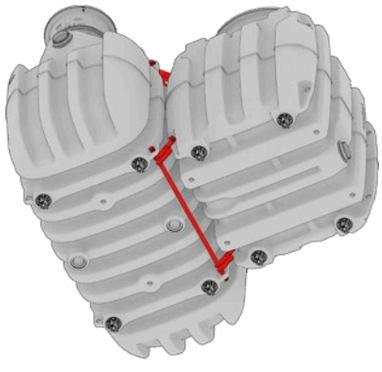


Fig. 27: Coupling tube from below

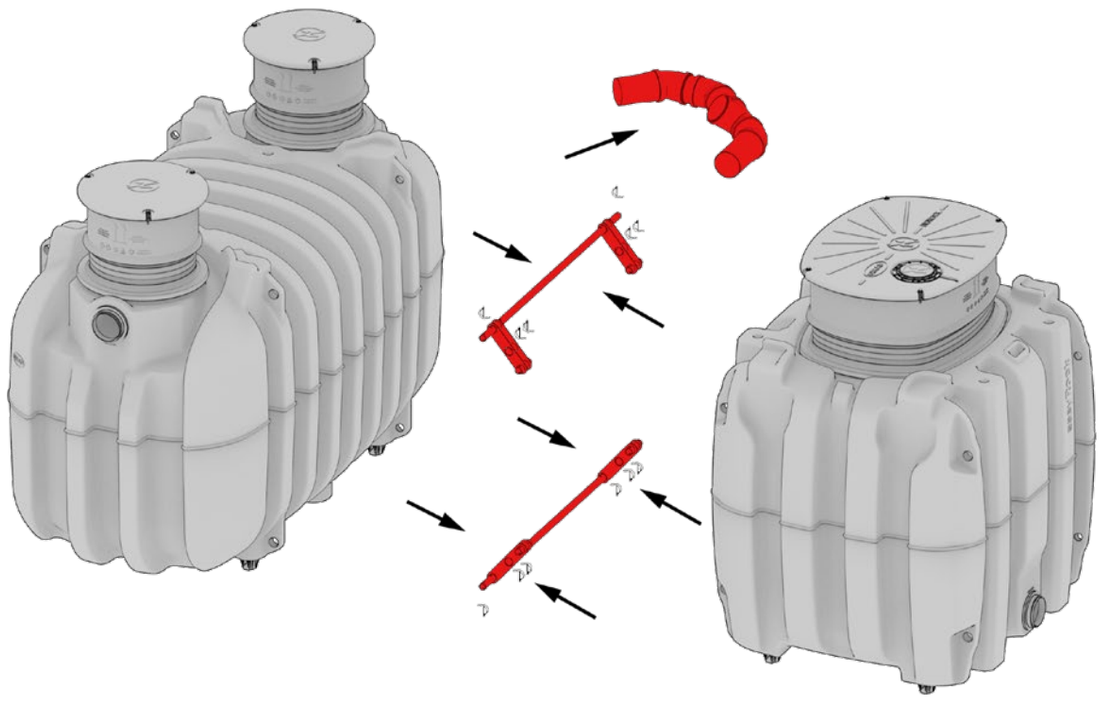


Fig. 28: Pull all spring cotter pins out of the coupling tubes

5.4 Assembling, installing and connecting the system

The order of the individual instructions in this section is based on typical installation situations and may vary according to local conditions. Contact Graf if you have any questions about changing the installation sequence.

General installation and assembly instructions

- Check the system for external damage before installation. Never install a damaged system; contact Graf company if any damage is found.
- When lifting the system and lowering it into place, make sure there is no danger to persons. Avoid bumping or hitting the system under all circumstances.
- In the vicinity of the system (≤ 20 cm), only use a hand tamper or similar for compaction. For mechanical compaction, use only light vibratory plate compactors (max. 20 kN, compaction depth max. 20 cm) at a minimum distance or with a minimum cover height of > 20 cm.
- Use only special lubricant or soft soap to lubricate the seals. Do not use mineral oil based lubricants.
- Install the system only in accordance with the installation instructions in *Section 5.2*. Contact Graf company if anything is unclear.

5.4.1 Prepare base of the pit and bedding layer

Requirements

- The pit must be excavated in accordance with the installation and planning specifications (see *Section 5.2.3*).
- The base of the pit must be level and flat.

Procedure

1. Clean the bottom of the pit.
   ⓘ There must be no hard objects such as rocks or remains of foundations at the bottom of the excavated pit.
2. If necessary, make good any irregularities in the ground.
   ⓘ There must not be any pockets of peat, mud or other materials with poor load-bearing capacity in the bottom of the pit.
   ⓘ Completely remove unsuitable materials, replace with load-bearing material and compact the repaired areas.
3. Pour a layer of backfill material at least 15 cm–30 cm high onto the base of the excavation pit and level it evenly.
   ⓘ Do not compact the bedding layer. The system must be able to sink in so that no cavities form under the system.

5.4.2 Unpack accessories

The access riser and the telescopic adapter for the treatment unit are packed on the side of the treatment unit. The other accessories are packed in the treatment unit.

Procedure

1. Undo the screws on the shaft cover on the treatment unit.
2. Remove the shaft cover and set aside.
3. Take the accessory parts out of the treatment unit.
   - ➙ Access risers and telescopic adapters for primary sedimentation tank including seals
   - ➙ Access riser and telescopic adapter for pump including seals (only for systems with pump)
   - ➙ Connection adapter DN 110|DN 100
   - ➙ Accessory bag with seals and installation accessories.
4. If the system will not be assembled and installed immediately, put the shaft cover back on the shaft and fasten it in place with the screws.

5.4.3 Open shaft covers

On delivery, the shaft covers are fitted directly on the shaft openings. The access shafts can be installed before or after the system has been placed and backfilled.

Procedure

1. Undo the screws on all shaft covers.
2. Remove all shaft covers and set aside.

5.4.4 Fitting the pump (optional accessory)

The pump must be fitted before the system is placed into the pit.
Please note that the small pipe section at the lower end of the pump shaft is not pre-assembled!

Procedure

1. Remove the pipe section at the lower end of the pump shaft from the accessory bag in the pump shaft.
2. Push the pipe section into the socket at the inlet of the pump shaft.
3. Hook the pump, using the metal bracket at the top, into the pocket located on the front of the treatment unit.

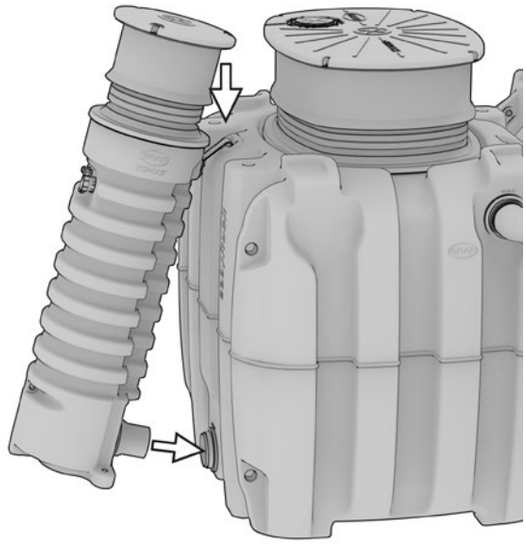


Fig. 29: Fitting the pump

4. Align the pipe section at the bottom of the pump inlet with the socket on the treatment unit outlet.
5. Press the lifting station against the treatment unit until the pipe section is fully inserted into the socket.
   ⓘ The back of the of the lifting station must lie flat against the treatment unit.

5.4.5 Place the system into the pit

Requirements

- If the system is to be installed in a line configuration, the primary sedimentation tank and the treatment unit must be separated from each other (see *Section 5.3.2.1*).

Procedure

1. Carefully lift the system / the tanks by approx. 30 cm using a crane or other suitable lifting gear and the supplied lifting slings.
2. Pull the tabs on the transport feet on the underside of the tanks outwards to release them, and remove the transport feet.
3. Carefully lift the system / the tanks over the excavated pit and turn it/them into the desired installation position.
4. Slowly lower the system / the tanks into the pit and place it/them on the bedding layer.
5. Remove, cut up and dispose of the lifting slings.
   ⓘ Disposable lifting slings are designed only for transportation as far as the pit and must not be reused.

5.4.6 Connect the overflow and ventilation system (line configuration only)

Procedure

- If the system is being installed in a line configuration, now refit the DN 110 pipes of the overflow and ventilation system.
  ⓘ Observe the markings next to the connections.
  “Water Out” – overflow on the primary sedimentation tank
  “Water In” – inlet on the treatment unit
  ⓘ Make sure that the overflow system is placed horizontally level and does not slope up or down.
  ⓘ The overflow and ventilation system can be extended with additional DN 110 pipes if required. The pipe diameter must not be changed under any circumstances.

5.4.7 Connect discharge pipe (not applicable when installing with optional accessory pump)

Procedure

1. Remove the plug from the outlet opening on the treatment unit.
2. If necessary, fit a connection adapter DN 110|DN 100 to the outlet.
3. Connect the discharge pipe leading to the reintroduction point to the outlet or to the connection adapter.

5.4.8 Align the system

Procedure

1. Place a spirit level alternately lengthwise and crosswise on the shaft openings of the primary sedimentation tank and treatment unit, and level the system in all directions. Alternatively, a spirit level can be placed on the stacking surfaces at the corners on the tops of the tanks.
2. Fill the primary sedimentation tank with clear water to a height of approx. 20 cm using a hose through the shaft opening. Stop the water flow once the water level reaches 20 cm.
   ⓘ This ballast water keeps the treatment unit in a stable installation position.

5.4.9 Install anti-buoyancy device (only for installation in damp soil)

- If the system is installed in damp soil, install the anti-buoyancy device(s) (original accessory) in accordance with the associated installation instructions.

5.4.10 Embed the system and backfill the sides

Procedure

- Before embedding and backfilling, loosely fit the shaft covers to the shaft openings to prevent the ingress of debris or contaminants.

Embed the system

1. Pour a layer of backfill material approximately 20 cm high around the system.
2. Distribute the backfill material so that the cavities on the undersides of the tanks and the discharge pipe (systems without optional accessory pump) are completely filled.
3. Level the backfill material evenly and carefully compact it.

Backfill the system.

1. Continue to fill the primary sedimentation tank with clear water.
   ⓘ During backfilling, the water equalises the internal and external pressures acting on the primary sedimentation tank.
2. While the primary sedimentation tank is filling, backfill the system in layers with backfill material, each layer 30 cm deep, to just below the connection openings for the wastewater inlet and the overflow and ventilation system. Carefully compact each layer.
   ⓘ During backfilling, ensure that no cavities form between the tanks (pack configuration). We recommend sluicing the backfill material between the tanks to achieve proper compaction.
   ⓘ The fill level in the primary sedimentation tank should always be at approximately the same level as the backfill. Regulate the flow of water if necessary.
3. When the water level is just below the inlet opening, stop the water flow and remove the hose.

5.4.11 Connect the wastewater inlet and ventilation pipes

Procedure

1. Connect the pipe for the wastewater inlet at the top on the front of the primary sedimentation tank.
2. Connect the ventilation pipe to the branch fitting in the overflow system.
3. Carefully install backfill material under and around the pipes.

5.4.12 Connect the pump (optional accessory)

Connect the discharge pipe for the raised outlet

The connection for the raised outlet is located in the recess in the area of the top rib on the pump shaft.

1. Unscrew and remove the cover from the connection for the raised outlet.
2. Connect the discharge pipe leading to the reintroduction point to the connection fitting with Ø 1½" external thread.

Connect the pump and alarm electrically

The pump and the alarm float switch are already installed in the pump shaft. The pump connection cable and the alarm signal cable (length 30 m) are tied to the top pipe of the raised outlet.

Warning

Hazardous voltage

- Danger of electric shock. An electric shock can cause serious burns and life-threatening injury.

→ Connection to the power supply must be carried out by a qualified electrician.

→ Isolate all cables from the power supply.

Connect the pump to the power supply

1. Route the cable for the power supply to the pump from the power source to the pump shaft.
2. Insert the threaded pipe of the cable gland, from the inside, into the connection opening at top of the pump shaft.
3. Slide the cable gland counter nut over the end of the power supply cable.
4. Feed the cable, from the outside, through the threaded pipe approx. 20 cm–30 cm into the pump shaft.
5. Screw the nut tightly onto the cable gland.
   ⓘ The pump connection cable is tied to the top pipe of the raised outlet.
6. Connect the wires of the pump connection cable and the power supply cable using the quick cable connectors. Make sure the wires are connected correctly.
   ⓘ PE-PE | P-P | N-N

Connect the float switch and alarm box

1. Mount the alarm box at the desired location in the building or in a switch cabinet.
2. Feed the float switch signal cable through the threaded pipe from the inside, and slide the cable gland counter nut onto the cable end from the outside.
3. Screw the counter nut onto the threaded pipe by a maximum of one thread and pull the cable outwards through the cable gland.
   ⓘ The cable must still sag slightly in the pump shaft.
4. Screw the nut tightly onto the cable gland.
5. Route the signal cable to the alarm box.
6. Connect the signal cable and the alarm box power supply in accordance with the associated instructions.

5.4.13 Fit the access shafts

Procedure

The method of fitting the access shafts is identical for all tanks.

Fit the access riser

1. Remove the shaft cover from the shaft opening.
2. Place the access riser with the collar edge pointing downwards over the seal onto the shaft opening.
3. Screw the access riser to the shaft opening (treatment unit accessory bag).

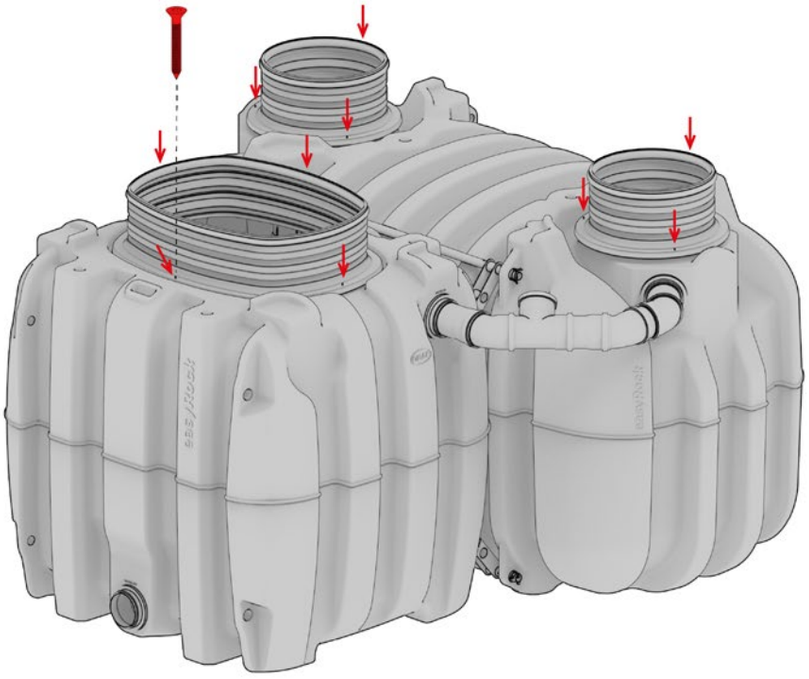


Fig. 30: Securing the access riser

Fit the shaft extension (optional accessory)

4. Place the seal for the shaft extension into the top groove of the access riser.
5. Push the shaft extension, with the socket pointing downwards, onto the access riser as far as it will go.

Fit the telescopic adapter

6. Place the seal for the telescopic adapter into the top groove of the access riser / shaft extension.
7. Push the telescopic adapter, with the socket pointing downwards, onto the access riser.
   ⓘ The depth to which the telescopic adapter is inserted can be individually adjusted to meet the desired installed dimension.

Fit the shaft cover

8. Place the seal for the shaft cover into the groove at the opening of the telescopic adapter.
9. Place the shaft cover onto the telescopic adapter and fasten it in place with the screws.

5.4.14 Install the upper backfill and covering layer

Procedure

1. Continue backfilling the system in layers with backfill material, each layer 30 cm deep, to approx. 20 cm below the top edge of the shafts. Carefully compact each layer.
   ⓘ Take possible subsequent settlement into account with regard to the backfill height.
2. For the covering layer, backfill excavated soil (if suitable) or other suitable backfill material up to the top edge of the shafts.
   ⓘ The shaft covers must not be covered with earth or any other material.

6 Commissioning

The commissioning of the system must be carried out by persons qualified[1] to maintain and service small wastewater treatment systems. The system must not be commissioned until all components and connections of the wastewater treatment system have been completely installed and correctly connected.

The initial commissioning of the system must take place before wastewater is discharged into the primary sedimentation tank for the first time. Commissioning must also be carried out if the system has been out of service for more than 6 months or if no wastewater has been fed into the system.

A minimum of 1 week is required to allow sufficient biomass to build up to achieve the system's cleaning capacity.

All commissioning and decommissioning must be documented in a maintenance log and reported to the relevant approval authority.

- Before commissioning, familiarise yourself with the safety instructions in *Section 3.5*.
- Read and follow the instructions given below.
- Fill the primary sedimentation tank completely with water before commissioning the system.

6.1 Commissioning tasks

The inspection and maintenance tasks specified in *Tab. 13* must be carried out during commissioning. The work steps of the individual tasks are described in *Section 7.2*.

Task	Activities	Instructions
Inspect the system	– Check accessibility of the system and shafts	*Section 7.2.2.1*
	– Check the stability of the system	*Section 7.2.2.2*
Check the wastewater system	– Check the fill level and water flow in the primary sedimentation tank	*Section 7.2.3.1*
	– Check the prefilter and overflow baffle to the treatment unit	*Section 7.2.3.2*
	– Check inflow to the treatment unit and function of the distribution system	*Section 7.2.3.3*
	– Check the outflow at the system outlet	*Section 7.2.3.9*
	– Check the pump (only systems with optional accessory pump)	*Section 7.2.4*
Check the ventilation system	– Check the installation and surroundings of the ventilation system	*Section 7.2.8.1*
	– Carry out a smoke test	*Section 7.2.8.2*

Tab. 13: Commissioning tasks

[1] Qualified personnel are persons who have passed a recognised examination to obtain the necessary specialist knowledge.

7 Inspection and maintenance

To ensure the proper functioning, service life and cleaning performance of the system, the checks as well as inspection, maintenance and servicing tasks described below must be carried out regularly.

- Prior to all inspection and maintenance work, familiarise yourself with the safety instructions in *Section 3.5*.
- Read and follow the instructions given below.

7.1 Maintenance schedule

7.1.1 Checks by the operator

The operator must regularly carry out the checks specified in *Tab. 14* and document them in an operating log book.

These checks may only be carried out by persons with the necessary competence[1] to operate the system.

Task	Activities	Instructions	Time interval
Inspect the system	– Check accessibility of the system and shafts	*Section 7.2.2.1*	Daily
	– Check the stability of the system	*Section 7.2.2.2*	Half-yearly
Check the wastewater system	– Check the fill level and water flow in the primary sedimentation tank	*Section 7.2.3.1*	Monthly
	– Check the outflow at the system outlet	*Section 7.2.3.9*	Monthly
Document mains water consumption	– Read off mains water consumption and enter in the operating log book	–	Annually

Tab. 14: Tasks and time intervals for checks

[1] Competent persons are those who, on the basis of their training, knowledge or practical experience, are able to ensure that they carry out checks on small wastewater treatment systems in the proper manner.

7.1.2 Inspection and maintenance by a specialist firm

In order to detect any faults or problems and take any necessary action, the inspection and maintenance tasks specified in *Tab. 15* must be carried out regularly. All work, checks and test results must be documented in a maintenance log.

All inspection, maintenance and servicing work must be carried out by persons who are qualified[1] to maintain and service small wastewater treatment systems.

The periods indicated are based on an average level of use that the system is designed for. The frequency of inspection and maintenance work and any additional work required must be adapted to the operating conditions.

Task	Activities	Instructions	Time interval
Inspect the operating log book	–	–	Half-yearly
Carry out general cleaning work	– Removal of deposits, blockages, etc.	–	Half-yearly
Inspect the system	– Check accessibility of the system and shafts	*Section 7.2.2.1*	Half-yearly
	– Check the stability of the system	*Section 7.2.2.2*	Half-yearly
Check the wastewater system	– Check the fill level and water flow in the primary sedimentation tank	*Section 7.2.3.1*	Half-yearly
	– Check the prefilter and overflow baffle to the treatment unit	*Section 7.2.3.2*	Half-yearly
	– Check inflow to the treatment unit and function of the distribution system	*Section 7.2.3.3*	Half-yearly
	– Check the treatment media	*Section 7.2.3.4*	Half-yearly
	– Replace the treatment media and clean the treatment unit	*Section 7.2.3.5*	If required
	– Check the outflow at the system outlet	*Section 7.2.3.9*	Half-yearly
	– Check the pump (only systems with optional accessory pump)	*Section 7.2.4*	Half-yearly
Take and analyse wastewater samples	– Sampling at the primary sedimentation overflow	*Section 7.2.5.1*	Half-yearly
	– Sampling at the system outlet	*Section 7.2.5.2*	Half-yearly
Determine the sludge volume	– Measure sludge height in the primary sedimentation tank	*Section 7.2.6*	Half-yearly
Sludge removal	– Pump out the sludge layer from the primary sedimentation tank	*Section 7.2.7*	If required
Check the ventilation system	– Check the installation and surroundings of the ventilation system	*Section 7.2.8.1*	Half-yearly
	– Carry out a smoke test	*Section 7.2.8.2*	Half-yearly

Tab. 15: Tasks and time intervals for inspection and maintenance

[1] Qualified personnel are persons who have passed a recognised examination to obtain the necessary specialist knowledge.

7.2 Maintenance work

This section describes the tasks and procedures for inspection, maintenance and commissioning. The intervals and the sequence of the maintenance tasks to be carried out regularly are listed in *Section 7.1*, *Tab. 14*. The steps for commissioning the system can be found in *Section 6.1*, *Tab. 13*.

7.2.1 Opening and closing shafts

Most inspection and maintenance operations require the shaft covers to be opened and removed.

- Open the shaft covers only for inspection and maintenance work, and close them securely once the work has been carried out.

Open shaft

1. Undo and completely remove the screws from the shaft cover, and set aside.
2. Remove the shaft cover.

Close shaft

1. Place the shaft cover on the shaft and align it so that the recesses in the cover are in line with the threaded bushes in the telescopic adapter.
2. Screw in the locking screws and tighten them firmly.

7.2.2 Inspect the system

7.2.2.1 Check accessibility of the system and shafts

The system must be accessible to persons and work equipment for inspection and maintenance work to be carried out. It must be possible to lay suction lines for sludge removal or pressure lines for cleaning lances without obstruction.

The shaft covers of the system must be able to be opened at all times and must not be covered with earth or any other material. Do not place any loads on the covers.

7.2.2.2 Check the stability of the system

Incorrect installation or exceeding the permitted loads may affect the stability of the system. A lack of stability can result in serious damage to the system itself or in the vicinity of the system.

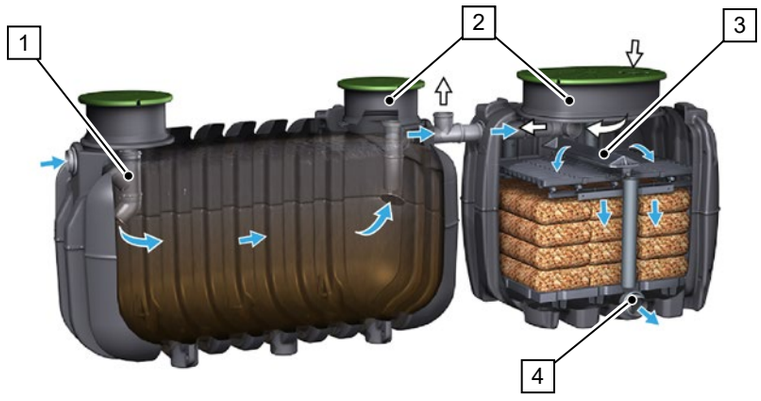
Check the system for deformation

1. Remove shaft covers.
2. Check the cross-section of the shaft openings on the tanks, and the shafts, for deformation.
   → No deformation evident: Stability is not impaired.
   × Deformation evident: The stability is impaired. Contact Graf to discuss how best to proceed.

7.2.3 Check the wastewater system

For the system to work properly, water must flow throughout the system and be checked at various points (see *Fig. 31*).

- To check the wastewater system, remove all shaft covers.



1 Wastewater inlet
2 Overflow with suspended matter filter
3 Distribution unit
4 Outlet

Fig. 31: Water flow - control points on example I Line configuration with primary sedimentation tank (liquid flows blue, air flows white)

7.2.3.1 Check the fill level and water flow in the primary sedimentation tank

Check level

- Check the fill level through the shafts of the primary sedimentation tank.
  ⓘ The primary sedimentation tank should be filled to approx. 5 cm below the inlet seal.

Fill level too high:

- Check the prefilter and the overflow to the treatment unit for blockages (see *Section 7.2.3.2*).

Fill level too low:

- When the system is used for the first time or after a long period of non-use, fill the primary sedimentation tank with clear water.
- If the fill level is too low during operation, check the primary sedimentation tank for damage.

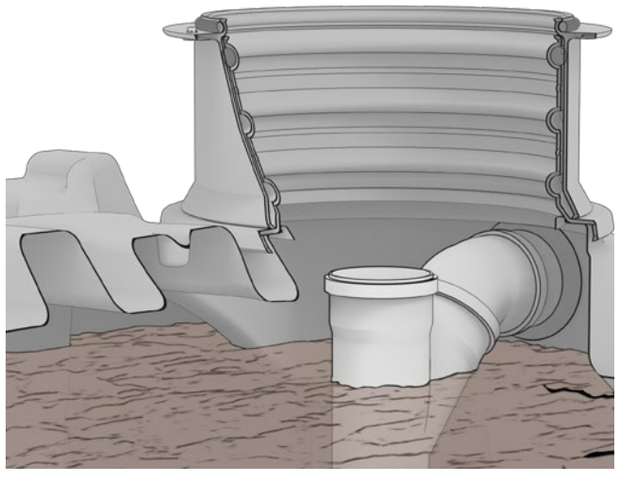


Fig. 32: Inlet baffle and water level in the primary sedimentation tank

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Check water inflow

1. Check the inlet baffle for visible blockages and clear if necessary.
2. Turn on a tap for several minutes or flush the toilet several times to check whether the primary sedimentation tank is being supplied with water via the inlet pipe.
   × If there is little or no water coming in, check that the inlet pipe is not blocked or damaged.

7.2.3.2 Check the prefilter and overflow baffle to the treatment unit

The prefilter is mounted in a holding device in the outlet baffle of the overflow system.

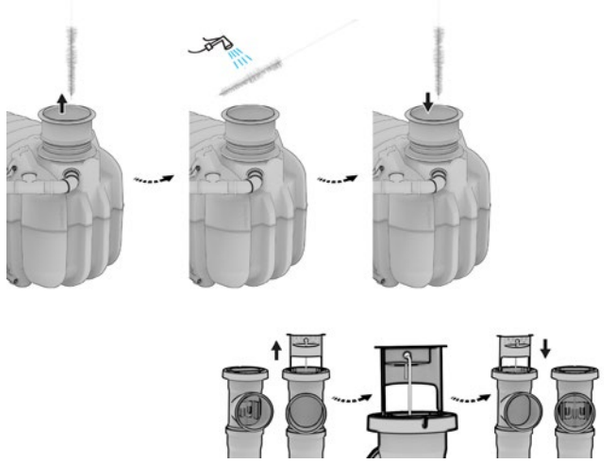


Fig. 33: Overflow baffle and prefilter

Procedure

1. Pull the holding device for the prefilter by the grip upwards out of the outlet baffle as far as it will go (applies to FilterSet type B).
   ⓘ The prefilter is hooked into the holding device by the handle end below the grip.
2. Unhook the prefilter and pull it out of the holding device.
3. Check the prefilter for damage.
   ⓘ The brush handle must not be bent, kinked or broken.
   ⓘ The centre bristles of the filter brush must not be crushed or damaged.
   × If the prefilter is damaged, replace it immediately.
4. Hold the prefilter over the open shaft at the primary sedimentation tank inlet and clean it with a jet of water.
5. Carefully push the prefilter back into the holding device, bristles first, and hook it on at the handle end.
   ⓘ Make sure that the brush handle is not bent and cannot come detached from the hook.
6. Push the prefilter with the holding device downwards into the overflow baffle as far as it will go.

7.2.3.3 Check inflow to the treatment unit and function of the distribution system

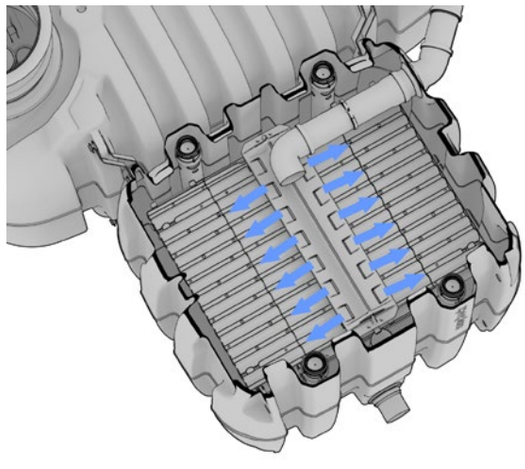


Fig. 34: Overflow and distribution system

Procedure

1. Check the tilting device and the distribution plate for blockages or fouling and clean if necessary.
   ⓘ To clean, remove the tilting device and the half-shells of the distribution plate (see *Section 7.2.3.7*).
   ⓘ If necessary, check the treatment media (see *Section 7.2.3.4*).
2. Turn on a tap or flush the toilet several times and check via the treatment unit shaft that water flows into the treatment unit.
   × If little or no water flows in, check the overflow pipe for blockages or damage.

3. Check that the water flows correctly from the overflow into the collection chambers and that the mechanism tilts evenly.
   ⓘ The water must be evenly distributed on the distribution plate and drain completely through the openings. Water must not accumulate on the distribution plate.
   × If the water is not distributed correctly and/or does not drain away, check the alignment of the distribution system and adjust if necessary (see *Section 7.2.3.6*).

7.2.3.4 Check the treatment media

The biofiltration treatment media are located under the distribution system in the treatment unit.

The biofiltration system consists of layered GRAFROCK media bags (see *Fig. 35* and *Fig. 36*). Impairments are usually visible in the top layer, so in most cases only this layer needs to be checked.

- To check the treatment media, remove the collection chamber tilting device and the half-shells of the distribution plate (see *Section 7.2.3.7*).

Fig. 35: Treatment media – GRAFROCK media bag

Procedure

- Use a telescopic rod with a hook attachment to handle the treatment media.

■ Inspect the GRAFROCK media for visible water accumulation and blockages.
   → No water accumulation or blockage visible:
   The GRAFROCK media are in good working order.
   × Visible water accumulation and/or blockage detected:
   The flow through the GRAFROCK media is impaired. The GRAFROCK media need to be replaced (see *Section 7.2.3.5*).

7.2.3.5 Replace the treatment media and clean the treatment unit

The biofiltration treatment media are located under the distribution system in the treatment unit. The biofiltration system consists of layered GRAFROCK media bags (see *Fig. 36*).

The GRAFROCK media must be replaced if they are completely clogged or contaminated by the introduction of improper substances into the system. The service life of the GRAFROCK media depends on the use and workload of the system. The average service life under normal use is approx. 10 years.

- To replace the treatment media and clean the treatment unit, the distribution system has to be removed (see *Section 7.2.3.7*).

Fig. 36: GRAFROCK media layers

Procedure

- Use a telescopic rod with a hook attachment to handle the treatment media.

1. Remove the mesh bags containing the GRAFROCK media and have them disposed of by a specialised company.
   ⓘ The GRAFROCK media can be treated as mineral substrate waste.
2. Clean the drainage floor with a water jet.
3. Remove the 3 parts of the drainage floor and set aside.
4. Clean the walls and floor of the treatment unit with a jet of water.
5. Refit the 3 parts of the drainage floor.
6. Arrange the treatment media in layers as shown in *Fig. 36*. Refer to the quantities and thicknesses in *Tab. 16*.
   ⓘ Only use new and genuine GRAFROCK media bags.
   ⓘ Arrange each media layer so that the entire cross-section of the treatment unit is filled without gaps and an even layer surface is created.
   ⓘ The top media layer must not touch the underside of the distribution plates.
7. Refit the distribution system in the treatment unit (see *Section 7.2.3.7*).

easyRock small wastewater treatment system		**Media layers**
PE	**Volume[a] *[l]***	**GRAFROCK**
4	2	5 layers: Height approx. 60 cm / 13.00 m² / 780 l
5	2	5 layers: Height approx. 60 cm / 145.00 m² / 870 l
6	3	5 layers: Height approx. 60 cm / 16.00 m² / 960 l
8	4	5 layers: Height approx. 60 cm / 16.00 m² / 960 l

[a] Volume of primary sedimentation tank

Tab. 16: Quantities and layer thicknesses of the treatment media

7.2.3.6 Check and adjust the alignment of the distribution system

Procedure

1. Check that the distribution system and overflow pipe are correctly aligned with each other.
   ⓘ The centre axis of the collection chamber tilting device must be in line with the overflow pipe.
2. If necessary, align the overflow pipe.
3. Remove the tilting device and set it aside.
4. Place a spirit level lengthwise on the tilting axle.
   ⓘ The tilting axle must be level.
5. If necessary, release the tilting axle from the retaining clips and adjust its alignment by screwing the retaining clips in or out.
6. Reinsert the tilting axle into the retaining clips and check the alignment with a spirit level.
7. When the tilting axle is correctly aligned, place the tilting device back on the axle.

8. Tilt the tilting device alternately to both sides and check that the tilting device rests on both support screws marked in yellow (2 screws each on the left and right).
9. If necessary, adjust the setting by turning the support screws in or out.
10. After adjustment, check the function of the distribution system (see *Section 7.2.3.3*).

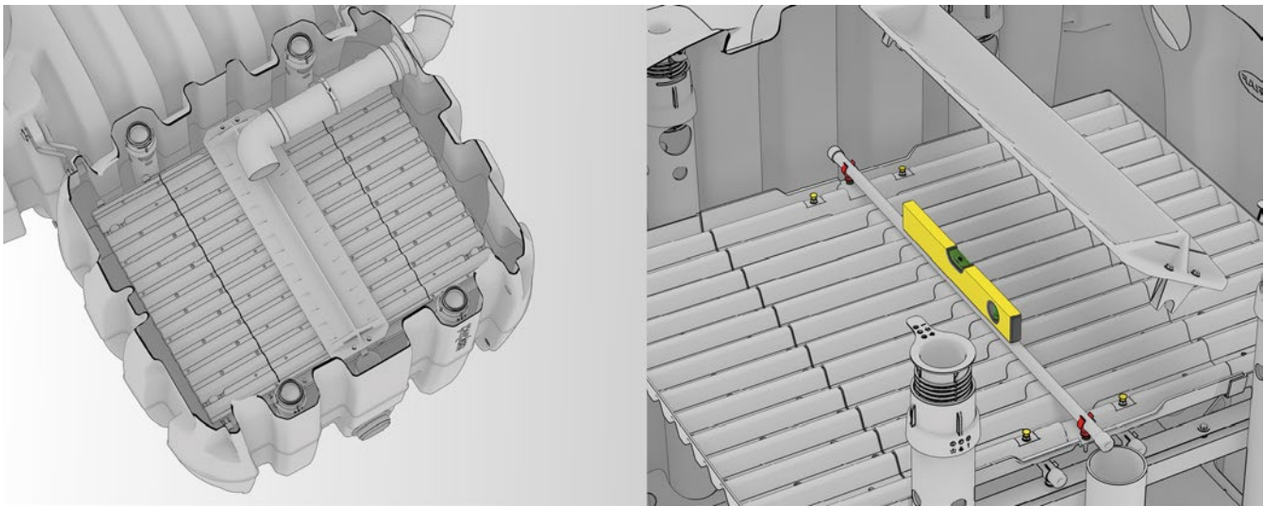


Fig. 37: Check alignment of the distribution system

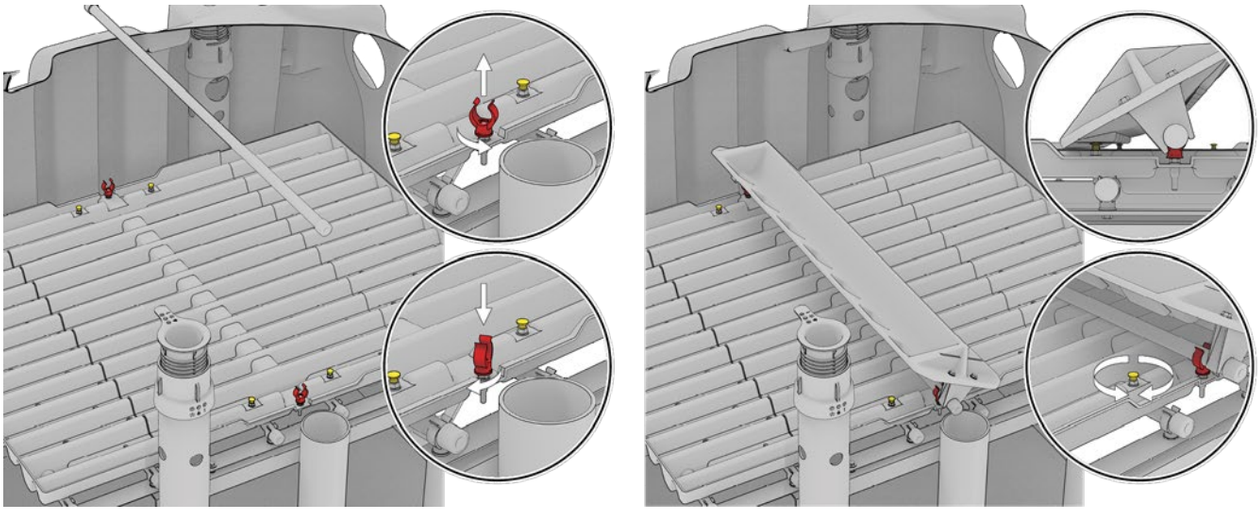


Fig. 38: Adjust alignment of the distribution system

7.2.3.7 Remove and refit the distribution system in the treatment unit

Remove distribution system

The distribution system must be completely or partially removed for cleaning in the event of heavy soiling and to check the filter media.

1. Take out the collection chamber tilting device.
2. Remove the centre shell from the distribution plate.
3. Take out the two outer shells of the distribution plate.

Refit distribution system

1. Place the two outer shells of the distribution plate onto the frame of the distribution system.
   ⓘ The outer support tubes of the frame must be seated cleanly in the bearing shells on the underside of the distribution plates, and the shells of the distribution plate must lie flat.
2. Place the centre shell on the distribution plate.
   ⓘ The centre shell must lie flat in the folds of the two outer shells.
3. Place the collection chamber tilting device on the tilting axle.
4. Check and adjust the alignment of the distribution system (see *Section 7.2.3.6*).

7.2.3.8 Adjust the alignment of distribution system frame

The frame consists of a lower and an upper angle profile. The lower angle profile is fixed, the upper angle profile can be adjusted using the nut.

Adjust the frame alignment

1. Remove the distribution system (see *Section 7.2.3.7*).
2. Loosen the nut:
   → The frame (the upper angle profile) moves upwards.
3. Tighten the nut:
   → The frame (the upper angle profile) moves downwards.
4. Reinstall the distribution system (see *Section 7.2.3.7*).

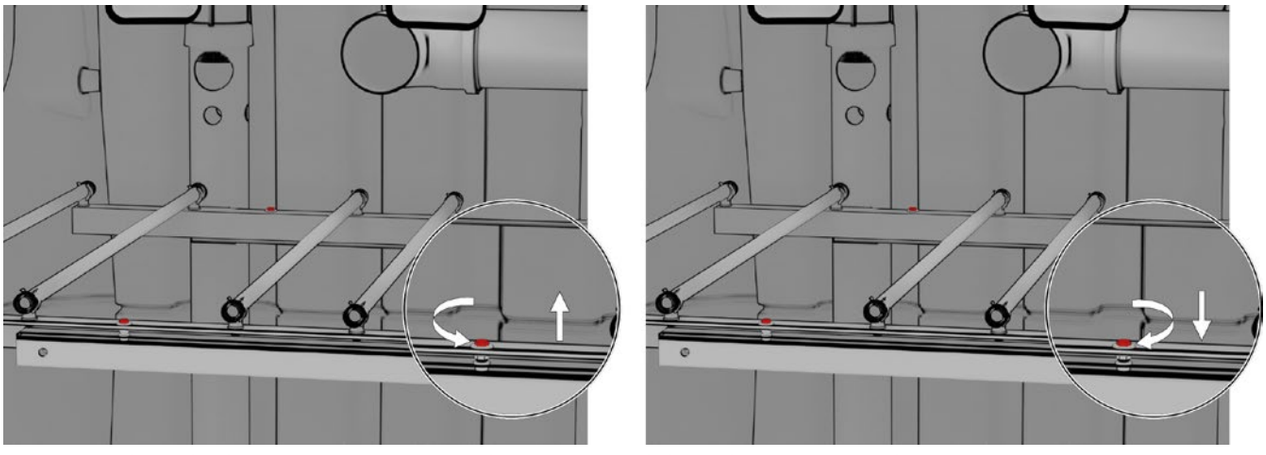


Fig. 39: Adjust the frame (distribution system), loosen nut on left / tighten nut on right

7.2.3.9 Check the outflow at the system outlet

The outflow from the system can be checked either at the reintroduction point for the treated wastewater or via the sampling shaft (optional accessory). In systems with a pump (optional accessory), the outflow can be checked through the shaft of the lifting system.

Procedure

- Turn on a tap or flush the toilet several times and see if water comes out of the system outlet.
  ⓘ When commissioning, add water until water has flowed through the entire system and filter media.
  × If there is little or no water flow, check the discharge pipe or the system for blockages or damage.

7.2.4 Check the pump (only systems with optional accessory pump)

Check the connections

1. Check that the pipes of the raised outlet are correctly installed and that the discharge pipe to the reintroduction point is connected.
2. Check the pump's electrical connection cable for correct connection and damage. Replace if necessary.
3. Check that the float switch signal cable for the alarm is connected correctly, and check for damage. Replace if necessary.

Check the function of the pump and the raised outlet

1. Turn on a tap or flush the toilet several times until enough water has collected at the bottom of the pump chamber to trigger the pump's float switch. Alternatively, a hose can be used to fill the bottom of the pump shaft.
   ⓘ The float switch must float up; the pump is supplied with power and must start up.
   × If the pump does not start, have the float switch and pump checked. Replace if necessary.
2. If the pump starts up, check at the reintroduction point whether water is flowing out of the discharge pipe.

7.2.5 Take and analyse wastewater samples

Local regulations and ordinances determine the type and scope of wastewater analyses to be performed. Further analyses may be required under certain circumstances. You can obtain information from the local authorities.

- Use a clean, transparent sampling cup with a telescopic handle and/or a vacuum sampler to collect wastewater samples.

7.2.5.1 Sampling at the primary sedimentation overflow

Procedure

1. Remove the shaft cover from the treatment unit and set it to one side.
2. Turn on a tap or flush the toilet several times until water flows from the primary sedimentation tank into the treatment unit.
3. Hold the sampling cup under the overflow pipe in the treatment unit and collect the pretreated wastewater.
4. Allow the water sample to stand for 20 minutes.
5. Inspect the water sample.
   ⓘ The water should be light brown, brown or yellow in colour and be cloudy to very cloudy.
   ⓘ There should be only a little sediment at the bottom of the cup.

7.2.5.2 Sampling at the system outlet

The sample of the treated wastewater should be taken at the reintroduction point or in the sampling shaft (optional accessory).

Using a vacuum sampler, a sample of the treated wastewater can be taken through the sampling pipe directly from the treatment unit or from the bottom of the pump (optional accessory).

Procedure

1. If necessary, turn on a water tap or flush the toilet a number of times to create a sufficient flow of water.
2. Collect the sample at the outlet at the reintroduction point or scoop it out of the sampling shaft or draw it up using the vacuum sampler.
   ⓘ When scooping, take the sample halfway up, not from the bottom or the surface of the water. Do not stir up the water.
3. Allow the water sample to stand for 20 minutes.
4. Inspect the water sample.
   ⓘ The water should be clear to yellowish in colour.
   ⓘ There should be very little sediment at the bottom of the cup.
   ⓘ The water should not have a foul or putrid odour. It may smell of fresh humus.
5. Test the sample for the parameters COD, pH value, temperature and settleable substances as well as NH_4-N.

7.2.6 Determine the sludge volume

The volume of sludge in the primary sedimentation tank must be checked regularly in order to plan the optimum intervals for sludge removal. The sludge volume in the primary sedimentation tank must not exceed 50 % of the usable volume. The height of the sludge level at the bottom of the tank must not exceed 50 cm (± 5 cm).

The primary sedimentation tank must be emptied of sludge in good time before the maximum level of sludge is reached. Too high a sludge level can lead to clogging of the prefilter and impairment of the biofiltration system. A sludge production of 26.00 m³ / year / PE can be used as a reference value for calculating the desludging intervals. Reference values for the desludging intervals are given in *Tab. 17*. The actual

frequency of desludging must be adapted to the specific conditions of use and determined by measuring the sludge level.

Measure sludge height in the primary sedimentation tank

The sludge height must be measured at both shafts of the primary sedimentation tank. The maximum sludge level of 50 cm must not be exceeded at either of the two measurement points.

1. Carefully immerse a sludge level measurement tube, valve down, through the open shaft of the primary sedimentation tank to the bottom of the tank. Avoid stirring up sludge.
2. Pull out the measuring tube again and place it in a vertical position.
3. Allow 20 minutes for the sludge to settle.
4. Measure and note down the sludge height.
5. When the measurement has been taken, hold the measuring tube just above the water level in the shaft of the primary sedimentation tank and empty the tube.

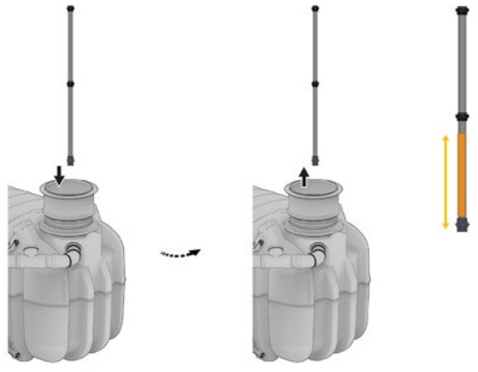


Fig. 40: Measure sludge height in the primary sedimentation tank

7.2.7 Sludge removal

The primary sedimentation tank must be desludged at the latest when the maximum sludge volume of 50 % of the useful volume has been reached.

Reference values for the desludging intervals are given in *Tab. 17*. The actual frequency of desludging must be adapted to the specific conditions of use and determined by measuring the sludge level (see *Section 7.2.6*).

Sludge should be removed by an authorised disposal company. The sludge disposal company must confirm the removal of the sludge to the operator by means of an emptying certificate. Extracted wastewater and sludge must be disposed of in accordance with local laws, ordinances and regulations.

easyRock small wastewater treatment system		Desludging interval
PE	Volume *[l]*	Months
4	1,830	17
5	2,270	17
6	2,670	17
8	3,630	17

[a] Volume of primary sedimentation tank

Tab. 17: Reference values desludging intervals

Pump out the sludge layer from the primary sedimentation tank

IMPORTANT

The system is not designed for vehicle or other heavy loads.

- Exceeding the permissible surface load can seriously damage the system.
- → Do not drive on or place heavy equipment on the system or within a 25.0 metre radius of it.

1. If a pressure relief shaft is installed upstream of the system, check that there is no water in the shaft. Completely pump out any water present.
2. Insert the suction hose of the suction pump through the open shaft to the bottom of the primary sedimentation tank.
3. Siphon off the sludge and wastewater down to a residual height of approx. 10 cm.
4. Fill the primary sedimentation tank completely with clear water again using a hose through the shaft opening.
   ⓘ While filling the tank, clean the tank walls and partition with a jet of water to loosen any grease deposits.

7.2.8 Check the ventilation system

7.2.8.1 Check the installation and surroundings of the ventilation system

Procedure

All details on the correct installation and surrounding conditions of the aeration and ventilation systems can be found in *Section 5.2.8.3*.

1. Check the aeration and ventilation systems for proper installation and damage.
2. Check that the aeration opening in the treatment unit shaft cover, or the aeration set used to raise the aeration inlet, is securely fitted and not blocked.

7.2.8.2 Carry out a smoke test

The smoke test is an effective method of checking the ventilation of the system using a smoke cartridge.

Procedure

1. Remove the shaft cover from the treatment unit. Close all other shaft covers.
2. Place a fireproof and low-heat-conducting base (ceramic plate, glass dish, etc.) on the distribution plate.
3. Place the smoke cartridge on the base and light it.
4. As soon as smoke comes out of the cartridge, close the shaft cover.
5. Observe the ventilation outlet.
   ⓘ Smoke should come out of the vent 2–3 minutes after the cartridge is lit.
   × If smoke does not escape, ventilation of the system is not guaranteed. A ventilation fan may be required.
6. After completing the test, remove the shaft cover from the treatment unit.
7. Remove the smoke cartridge and the base.
8. Close the shaft cover.

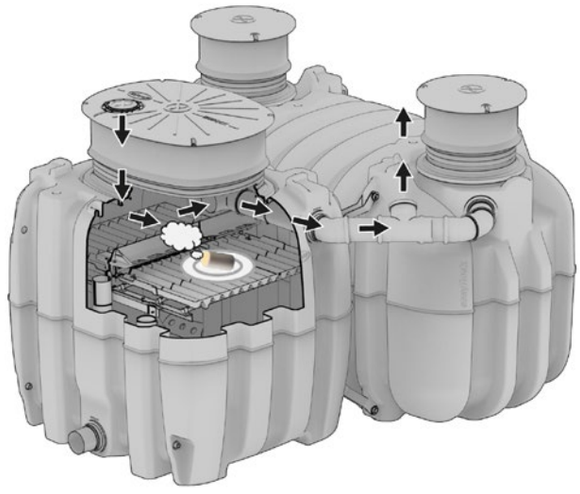


Fig. 41: Smoke test

8 Troubleshooting

The following tables provide information to assist technicians in diagnosing and correcting any malfunctions in the system. If the cause of a problem cannot be determined from the tables, please contact Graf company.

8.1 Primary sedimentation tank

8.1.1 Bad odours

Possible cause	Measures
– Leaks in the ventilation system – Leaks in the building's wastewater system (washbasin, WC, bath, shower, pipes, traps, etc.) or in the inlet pipe to the wastewater treatment system – Leaking covers of the sewer or other equipment installed upstream of the system (grease separator, pump system, etc.) – Inadequate ventilation (Ø vent pipe < 100 mm, incorrect positioning of the exhaust air opening, elbows > 45° etc.) – Severe restriction of air circulation in the primary sedimentation tank itself, e.g. due to an excessively thick floating layer (grease, floating matter, etc.)	– Check the ventilation and wastewater system upstream of the primary sedimentation tank for leaks. – Check that all covers are closed and undamaged. – Check the cover seals. – Check the ventilation system (see *Section 7.2.8*). – Measure the sludge level in the primary sedimentation tank (see *Section 7.2.6*). (Also measures the thickness of grease and floating matter on the water surface.)

Tab. 18: Troubleshooting – Bad odours primary sedimentation tank / pretreated wastewater

8.1.2 Unusual odour, colouring and/or suspended solids in the primary sedimentation tank

Possible cause	Measures
– Hydraulic overload: excessive volume of water flowing through the wastewater treatment system – Undersizing of the wastewater tank in relation to its normal use. – Introduction of improper substances into the system (see *"Intended use"* section in *Part 1 of the instructions*) – Maximum sludge level exceeded – Filter maintenance not performed (half-yearly)	– Make sure that no rainwater system is connected to the system. – Make sure that no surface water can enter the system. – Check the water meter to see whether the water consumption is equal to or less than the system's rated value. – If a grease separator is installed upstream of the system, check the separator (regular emptying, correct sizing and maintenance). – If necessary, have the primary sedimentation tank emptied (see *Section 7.2.7*).

Tab. 19: Troubleshooting – Properties of pretreated wastewater

8.1.3 Water backing up into the building

Possible cause	Measures
– Blockage at the inlet of the wastewater tank (no or only low outflow of raw wastewater at the inlet)	– Remove the cover of the primary sedimentation tank and check the inlet baffle for blockages. If necessary, flush out the inlet baffle with a jet of water (see *Section 7.2.3.1*).
– Blockage in the building's wastewater system or in the inlet pipe to the wastewater treatment system	– Call a plumbing company to check that the drain is not blocked.
– Prefilter clogged or damaged	– Clean the prefilter and replace if necessary (see *Section 7.2.3.2*).
– Prefilter not working – The bristles of the brush are crushed or damaged in the centre – Broken retaining handle	– Replace the prefilter (see *Section 7.2.3.2*). – If the brush handle of the prefilter shows signs of corrosion, check the ventilation system (see *Section 7.2.8*). Excessive concentrations of gas in the primary sedimentation tank are conducive to corrosion.

Tab. 20: Troubleshooting – Backflow into the building

8.2 Treatment unit

8.2.1 Bad odours

Possible cause	Measures
– Primary sedimentation tank malfunction – Inadequate ventilation (Ø vent pipe < 100 mm, incorrect positioning of the exhaust air opening, elbows > 45° etc.) – Impaired function of the treatment media (service life exceeded, hydraulic overload, system capacity exceeded) – Introduction of improper substances into the system	– Investigate possible causes at the primary sedimentation tank (see *Section 8.1*). – Check the ventilation system (see *Section 7.2.8*). – Check the treatment media (see *Section 7.2.3.4*) and replace if necessary (see *Section 7.2.3.5*).

Tab. 21: Troubleshooting – Odour treatment unit / treated wastewater

EN

8.2.2 Unusual odour, colour and/or suspended solids in the treated wastewater

Possible cause	Measures
– One-off or continuous hydraulic or organic overloading of the treatment unit – Introduction of improper substances into the system (see *"Intended use" section* in *Part 1 of the instructions*) – Increased inflow of suspended solids into the treatment unit due to lack of maintenance (e.g. delayed desludging) or malfunction of the primary sedimentation tank – Inadequate ventilation (Ø vent pipe < 100 mm, incorrect positioning of the exhaust air opening, elbows > 45° etc.) – Poor distribution of the pretreated wastewater in the distribution system – Malfunction of the pump (if present) – Unsuitable pump (third-party supplier)	– Investigate possible causes at the primary sedimentation tank (see *Section 8.1*) – Check the ventilation system (see *Section 7.2.8*). – Check the function of the distribution system (see *Section 7.2.3.3*). – Check the treatment media (see *Section 7.2.3.4*) and replace if necessary (see *Section 7.2.3.5*). – Check the pump (if present, see *Section 7.2.4*)

Tab. 22: Troubleshooting – Properties of treated wastewater

8.2.3 Water accumulation (puddling) in and/or clogging of treatment media

Possible cause	Measures
– One-off or continuous hydraulic or organic overloading of the treatment unit – Introduction of improper substances into the system – Increased inflow of suspended solids into the treatment unit due to lack of maintenance (e.g. delayed desludging) or malfunction of the primary sedimentation tank – Inadequate ventilation (Ø vent pipe < 100 mm, incorrect positioning of the exhaust air opening, elbows > 45° etc.) – Poor distribution of the pretreated wastewater in the distribution system	– Investigate possible causes at the primary sedimentation tank (see *Section 8.1*). – Check the ventilation system (see *Section 7.2.8*). – Check the function of the distribution system (see *Section 7.2.3.3*). – Check the treatment media (see *Section 7.2.3.4*) and replace if necessary (see *Section 7.2.3.5*).

Tab. 23: Troubleshooting – Treatment media

8.2.4 Alarm triggered (only systems with pump)

Possible cause	Measures
– Blockage in the system downstream of the treatment unit (pipes, shafts, etc.) – Backflow into the system outlet – Malfunction of the pump (if present) – Unsuitable pump (third-party supplier)	– Check the system downstream of the treatment unit. – Ensure that the groundwater level cannot exceed the maximum immersion depth of the system. – Check the pump (if present, see *Section 7.2.4*). Unblock the non-return valve if necessary. – Check the performance data of the pump (third-party provider).

Tab. 24: Troubleshooting – Alarm triggered

9 Decommissioning and disposal

At the end of its service life, the system must be decommissioned and disposed of in accordance with local regulations. Check with your local authorities and make sure you comply with all legal requirements.

- Before decommissioning and disposal, familiarise yourself with the safety instructions in *Section 3*.
- Read and follow the instructions given below.

The small wastewater treatment system consists almost entirely of recyclable materials.

- Have the system completely drained and cleaned for disposal by a qualified specialist company.
- Have a specialist company dispose of the drained off substances, filter media and suspended matter filter.
- Dismantle and remove the cleaned system.
- Separate components by type of material and send the materials separately for recycling and disposal in accordance with local regulations.

Components	Material	Disposal
Tanks, shafts, covers, plastic parts of the treatment unit	PE, HDPE	Recycling
Seals		Energy recovery, recycling
Pipework	PVC, HDPE	Energy recovery, recycling
Screw fittings and bolts	Stainless steel	Recycling
Filter media	Volcanic rocks	Recycling
Submersible pump (only with optional accessory pump)		Electrical/electronic waste

Tab. 25: Materials used – easyRock small wastewater treatment system

10 Technical documentation

10.1 easyRock declaration of performance

Declaration of performance easyRock

Nr. 116/EN

1. Unique identification code of the product-type	**easyRock 4 PE** **easyRock 5 PE** **easyRock 6 PE** **easyRock 8 PE**
2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4)	**easyRock 4-8 Inhabitants** **Size and serial number on the label inside the tank**
3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer	**EN 12566-3:2005+A2:2013: Prefabricated and/ on-site installations for the treatment of domestic wastewater**
4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5)	**GRAF SAS** **45 route/rue d´Ernolsheim** **67120 Dachstein-Gare** **France**
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. Name and identification number of the notified body	**CERIB - NB 1164** **PIA - Prüfinstitut für Abwassertechnik GmbH - NB 1739**

7. **Declared performance** (with regard to the harmonized norm EN 12566-3:2005+A2:2013)

	Performance			Test report No.
Cleaning capacity	Nominal organic daily load (BOD_5) = 0.06 kg/d per PE. Nominal daily inflow (Q_N) = 150 l per PE.			
Treatment efficiency	COD: BOB_5: NH_4-N: SS:	95 % 98 % 75 % 99 %	41 mg/l 7 mg/l 14 mg/l 5 mg/l	CERIB 046738-A
Watertightness	Passed			PIA2025-WD-2505-1033 PIA2025-WD-2512-1089
Stability	max. earth covering WET:		0,87 m 1,04 m	PIA2026-ST-PIT-2512-1089
Durability	Passed			CAPE 21-07198/2
Reaction to fire	Class E			PIA2023-BV-2309-1047
Release of dangerous substances	NPD			

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:

Dominique Lacombe
-Directeur Commercial-
Dachstein, 15.04.2026

10.2 easyRock pump declaration of performance (optional accessory)

Declaration of performance
Lifting unit easyRock

Nr. 117/EN

1. Unique identification code of the product-type	**Lifting unit easyRock**
2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4)	**Serial number on the shaft.**
3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer	**EN 12050-2:2000: Collecting and automatically lifting of faecal-free wastewater**
4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5)	**GRAF SAS 45 route d'Ernolsheim FR-67120 Dachstein-Gare**
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. Name and identification number of the notified body	**PIA - Prüfinstitut für Abwassertechnik GmbH - NB 1739**

7. **Declared performance (with regard to the harmonized norm EN 12050-2:2000)**
Test report number: PIA2025-AH-2507-1048A

Performance	
Water tightness	No leak
Pumping of solids substance	No accumulation of solid substances
Ventilation	Ensured
Pipe connection	DN 40
Minimum flow speed	0,7 m/s at 40 kPa
Minimum passage section for	25 mm
Minimal usable volume	7 L
Load-bearing capacity of the collecting tank	0 N
Structural stability of the collecting tank	No deformation
Durability: Water tightness	No leak
Durability: Pumping performance	No accumulation of solid substances
Durability: mechanical resistance	35 °C
Noise level	70 dB(A)

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:

Dominique LACOMBE
-Directeur Commercial-
Dachstein-Gare, 03.11.2025

10.3 TOP2-VORTEX/GM submersible motor driven pump data sheet

TOP-VORTEX Submersible pumps for DRAINAGE

Dirty water

Domestic use

※ TOP-VORTEX
Drainage pumps:
reliable and durable

PERFORMANCE RANGE

- Flow rate up to **170 l/min** (10.2 m³/h)
- Head up to **8.7 m**

INSTALLATION AND USE

TOP-VORTEX pumps are suitable for draining clear water without abrasive particles that will not damage the pump's components. Construction features ensure user-friendly and safe operation, including motor cooling and a double shaft seal.

These pumps are particularly well-suited for domestic applications, including draining dirty water, emptying tanks, managing domestic drains, and clearing sumps, even in the presence of suspended solids of up to 25 mm in diameter.

APPLICATION LIMITS

- Maximum operating depth below water level up to **3 m** (with an appropriately sized power cable)
- Liquid temperature up to **+40 °C** and up to **+90 °C** for short bursts (up to 3 minutes max) for intermittent service
- Capable of processing suspended solids up to **Ø 25 mm**
- Draining capability up to **25 mm** from the bottom

INCLUDES

※ **5 m** power cable
※ Float switch

PATENTS - TRADE MARKS - MODELS

- Patent No. IT0001428923
- Registered Community Model No. 342159-0011

AVAILABLE UPON REQUEST

※ Mechanical seal options available
※ Pumps with **10 m** power cable
※ Different voltage requirements 60 Hz frequency

※ **TOP-VORTEX/GM** " pumps with magnetic float operation (suitable for small sumps)

※ TOP-VORTEX/GM

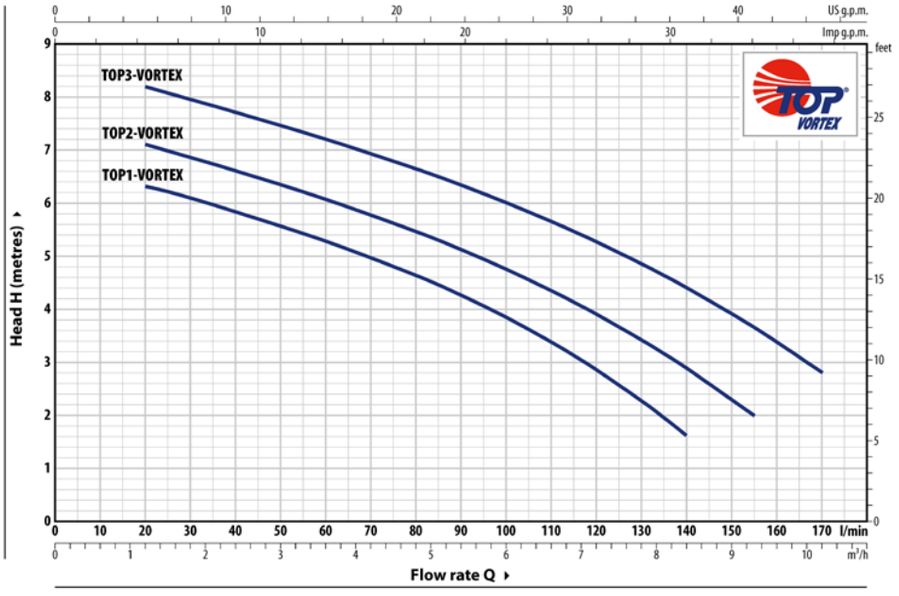
50 Hz | TOP-VORTEX

EN

PEDROLLO
the spring of life

CURVES AND PERFORMANCE DATA

50 Hz



TYPE Single-phase	POWER (P2) kW	POWER (P2) HP	Q m³/h	0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.3	10.2
			Q l/min	**0**	**20**	**40**	**60**	**80**	**100**	**120**	**140**	**155**	**170**
TOP 1 - VORTEX	0.25	0.33		7	6.3	5.8	5.3	4.6	3.8	2.8	1.6		
TOP 2 - VORTEX	0.37	0.50	**H** metres	7.6	7	6.6	6	5.5	4.8	4	3	2	
TOP 3 - VORTEX	0.55	0.75		8.7	8.2	7.7	7.2	6.7	6	5.3	4.4	3.7	2.8

Q = Flow rate **H** = Total manometric head

Performance curves comply with EN ISO 9906 Grade 3B tolerance limits.

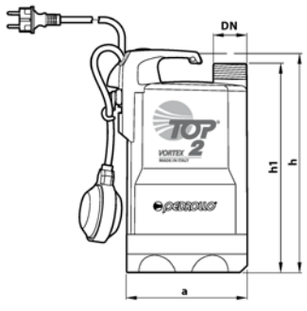
ABSORPTION

TYPE Single-phase	VOLTAGE **230 V**
TOP 1 - VORTEX	1.5 A
TOP 2 - VORTEX	2.0 A
TOP 3 - VORTEX	2.9 A

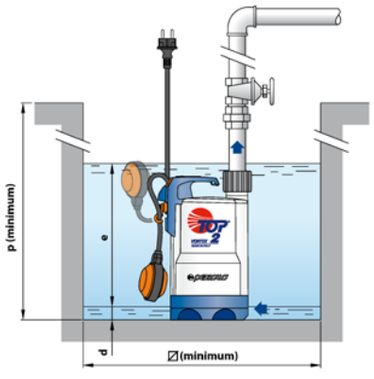
TOP-VORTEX | 50 Hz

TOP-VORTEX Technical data

DIMENSIONS AND WEIGHT

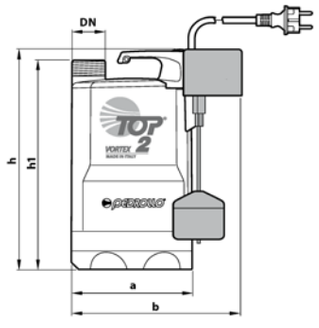


Typical installation

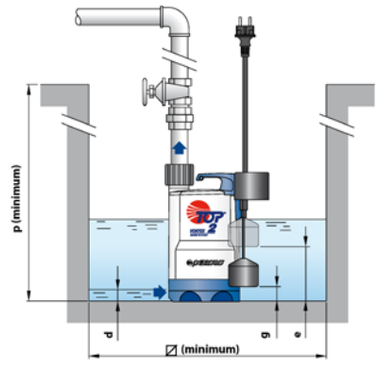


TYPE	PORT	DIMENSIONS mm							kg
Single-phase	**DN**	a	h	h1	d	e	p	⍁	
TOP 1 - VORTEX	**1¼"**	152	288	268	25	adjustable	350	350	5.4
TOP 2 - VORTEX									5.4
TOP 3 - VORTEX			318	298					6.8

※ **Version with 'GM' magnetic float switch**



Typical installation



TYPE	PORT	DIMENSIONS mm									kg
Single-phase	**DN**	a	b	h	h1	d	e	g (adjustable)	p	⍁	
TOP 1 - VORTEX/GM	**1¼"**	152	200	288	268	25	170	40	350	220	5.5
TOP 2 - VORTEX/GM											5.5
TOP 3 - VORTEX/GM				318	298		200	65			6.9

PALLET CAPACITY

TYPE	NO. OF PUMPS
Single-phase	
TOP 1 - VORTEX	96
TOP 2 - VORTEX	96
TOP 3 - VORTEX	96

50 Hz | TOP-VORTEX

PEDROLLO
the spring of life

MATERIALS AND COMPONENTS

1	**Pump body**	Technopolymer
2	**Suction filter**	Technopolymer
3	**Suction cover**	Technopolymer
4	**Diffuser**	Technopolymer
5	**Impeller**	VORTEX technopolymer type
6	**Motor sleeve**	Stainless steel **AISI 304**
7	**Motor cover**	Stainless steel **AISI 304**
8	**Motor shaft**	Stainless steel **AISI 431**

9 Double shaft seal with interposed oil chamber

Seal	Shaft	Materials
STA-12R	Ø 12 mm	Ceramic / Graphite / NBR

Shaft seal Ø 12 x Ø 19 x H 5 mm

10 Capacitor

11 Electric motor

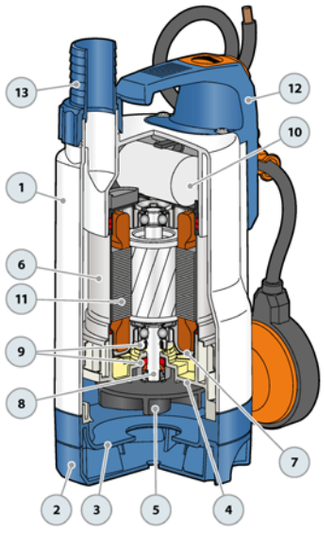
TOP-VORTEX: single-phase 230 V - 50 Hz with winding integrated thermal motor protection
- Continuous running duty S1
- Insulation: Class F
- Protection rating IP X8

12 Handle group

Including:
– Float switch
(vertically operating float switch in GM versions)
– 5 metres power cable type 'H07 RN-F' with Schuko plug

13 Ferrule and hose nozzle

Hose connector Ø 35 mm



TOP-VORTEX | 50 Hz