GRAF CARAT UNDERGROUND RAINWATER TANKS

INSTALLATION INSTRUCTIONS

Please ensure you read and understand the instructions before installation.

15 Year Warranty

GRAF

Contents

Tank installation and maintenance instructions:

Minimax Filter installation and maintenance instructions:

Universal External Filter installation instructions:

Optimax External Filter installation:

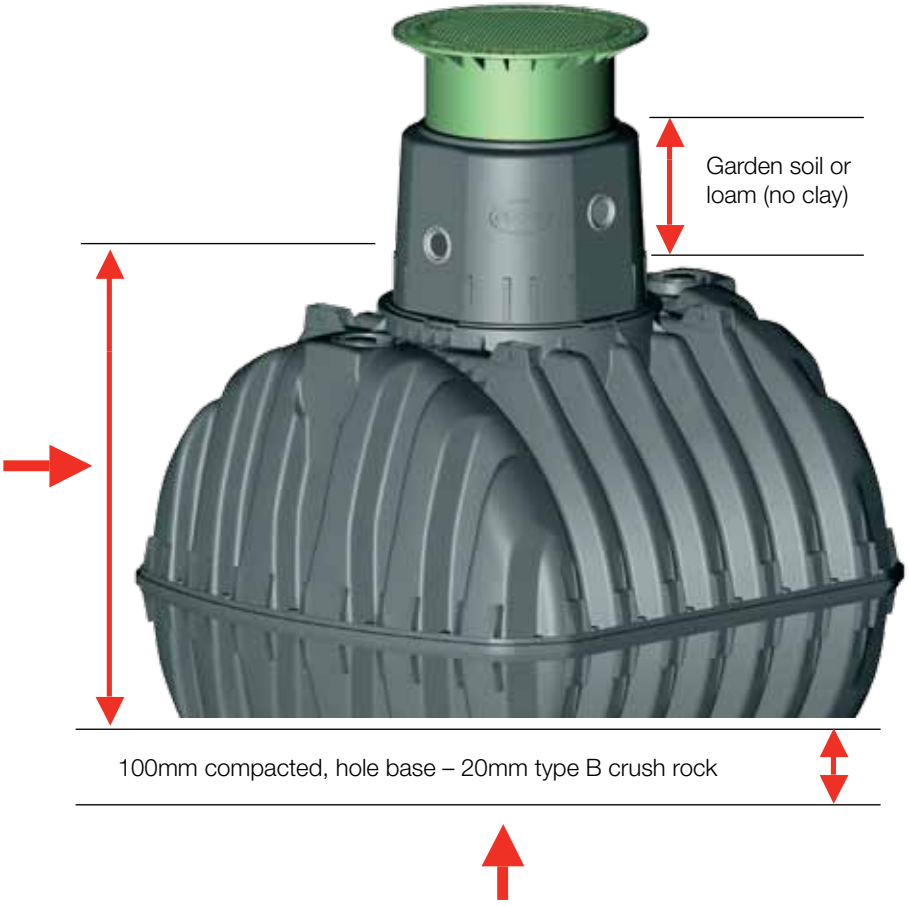
Pumps & Mains Water Interconnection Device:

Important Safety Notice

For personal safety reasons the instructions described in this document must be followed under all circumstances.
Warranty rights will not be recognised if installations do not comply with these instructions. These instructions are specifically designed for the Graf Carat rainwater storage tank and its components. Separate instructions are supplied with additional or optional Graf equipment. Contact Reece immediately if instructions are incomplete or missing. The tank must be checked for any damage upon receipt and again before placement into the trench. Installation must be carried out by a licensed installer.

Backfill Materials

7mm Minus (preferred), Washed Sand



100mm “Compacted” Hole Base
20mm Type B Crushed Rock (porous)

Wrong Backfill – Non Porous Materials (Do Not Use)

Builders Sand, Clay, Cement, Types C & D Crushed Rock, and any other non porous or water holding soils.
Incorrect soils used may “void warranty”.

Installation and maintenance instructions

1. General safety instructions

1.1 Safety

As Occupational Health and Safety legislation differs in each state and territory, it is necessary to refer to all relevant Occupational Health and Safety legislation, regulations and Australian Standards in your state or territory at all times during installation, assembly, servicing and repair of the Graf Carat rainwater storage tank systems.

Current statutory regulations and all relevant Australian standards shall be taken into consideration at all times.

The system and any of its individual parts must be installed by a licensed person. Installation by a non-licensed person may void warranty.

The entire system must be shut down before any maintenance can be undertaken. Once any maintenance is completed the tank must be properly sealed/locked by means provided with the tank to prevent future unauthorized entry.

Graf offers a wide range of accessories which all match each other. The use of non Graf accessories may lead to the voiding of warranty and any subsequent claims of liability from any resulting damages.

1.2 Identification of water pipes and outlets

All service water pipes and outlets leading from the Graf water tank should be identified in accordance with AS/NZS3500.1:2003-Section 9 and other relevant local plumbing regulations to avoid inadvertent connection with the drinking water supply.

In order to avoid the wrong connection between the drinking water and the rain water pipe work, all conduits and tappings of rain water have to be marked clearly with “RAINWATER” in writing and be in accordance with local standards.

All non-drinking tank water outlets should be clearly marked “RAINWATER” and we recommend they be installed with vandal proof taps.

Depending on local laws, rain water may or may not be suitable for human consumption and/or use for personal hygiene.

Example of typical rainwater signage

Continuous green pipe marker for pipe work less than 40mm diameter used to identify rainwater pipe work

1.3 Maintenance

In the event of work needing to be carried out inside the tank, as Occupational Health and Safety legislation differs in each state and territory, reference should be made to confined spaces legislation in your state or territory.

1.4 Site

As Occupational Health and Safety legislation differs in each state and territory, reference should be made to excavation and trenching legislation in your state or territory with respect to the use of excavation equipment and relevant trenching legislation in reference to shoring, battering and depth specific regulations.

1.5 Lifting of Tanks

Occupational Health and Safety legislation and regulations differ in your state and territory, therefore reference should be made to your state or territory legislation when lifting, handling or moving of Graf water tanks.

1.6 Protection of Site

It is the responsibility of the installing contractor and property owner to ensure that the area that the tank/tanks are installed in is protected against damage by third parties during and after the completion of the installation. E.g. keeping heavy vehicles out of the construction area.

1.7 Future Landscaping works must be taken into consideration

When locating the tank ensure you take into consideration the location and positioning of future landscaping features such as garden beds, paths, driveways, brick walls etc.

2. Depth of soil cover over tanks

2.1 Adjustments of Telescopic Shaft

Soil depth of telescopic shaft in garden areas.

Note: For Standard Telescopic Shaft & Lid
Minimum 750mm – Maximum 950mm
Maximum load rating of standard lid is 150kgs.

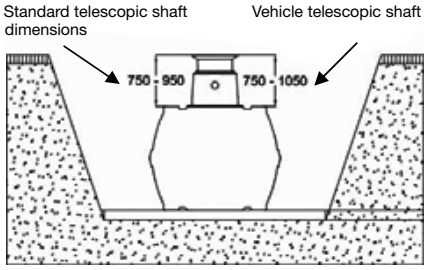


Diagram 2.1

2.2 Extension Riser

Extension riser and telescopic shafts.

Suitable for low water pipes or where existing hole is deeper than the required height for the tank, or where the contractor has already installed the tank and his ground level is higher than the shaft fully extended.

Also suitable in areas susceptible to below zero degrees celsius temperature.

Note: If groundwater exists, maximum soil depth of 1000mm.

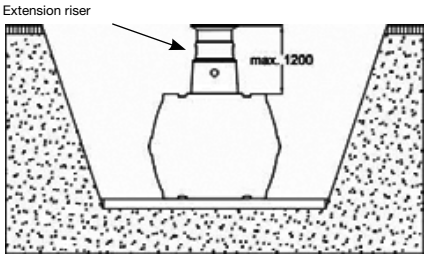


Diagram 2.2

2.3 Passenger Vehicles

Soil depth of telescopic shaft and removable cast iron lid (class B) in areas subject to passenger vehicle traffic (without groundwater).

Top of tank to finished ground level.

Refer diagram 6.4

Note: For vehicle telescopic shaft min 800mm – Max. 1200mm

Maximum weight over Graf tanks = 3.5 tonnes gross vehicle mass (GVM)

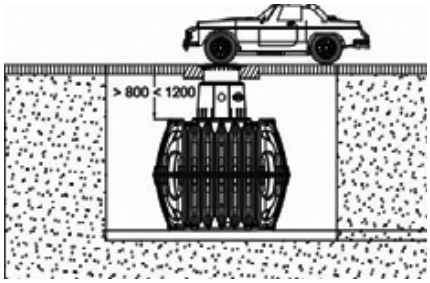


Diagram 2.3

2.4 Trucks

Carat tanks must not be installed below areas used by vehicles heavier than passenger cars. For Class D loading, please contact Reece for Specialist advice.

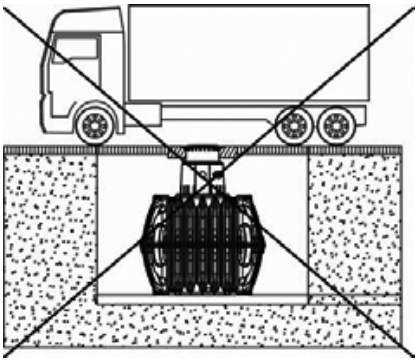


Diagram 2.4

2.5 Ground Water

Soil depth of installation in groundwater – the shaded area illustrates the allowable immersion depth for the tank (not under areas subject to vehicle traffic).

Groundwater level must not be higher than the midline join of the tank shell. If ground water is higher than the midline join contact Reece for advice.

Refer table 5.3.2

Note: Min 800mm – Max 1000mm
(require Graf Maxi Lid)

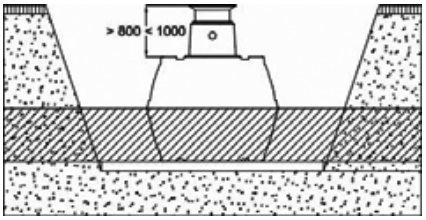


Diagram 2.5

2.6 Settling of Soil

Settling of soil might occur and consideration needs to be given to allow for such.

3. Technical data

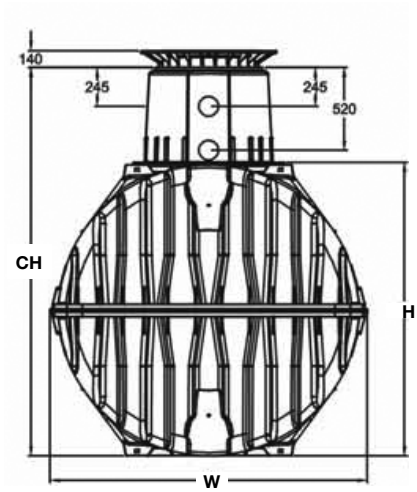


Diagram 3.1

End elevation of Carat water tank

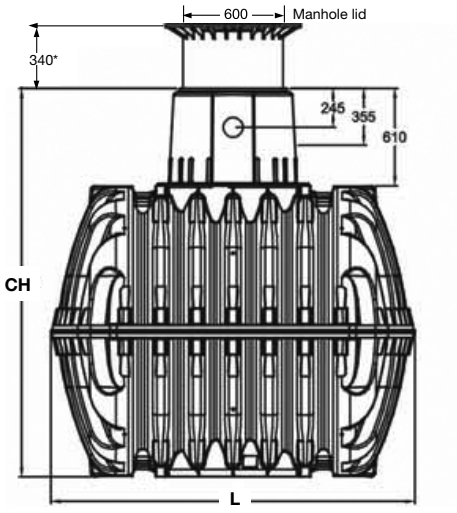


Diagram 3.1.1

Side elevation of Carat water tank

* Measurements shown is for standard telescopic shaft. For the vehicle telescopic shaft, measurement is 440mm

DIMENSIONS				
Tank	2700 litres	3750 litres	4800 litres	6500 litres
Weight	120 kg	150 kg	185 kg	220 kg
L	2080 mm	2280 mm	2280 mm	2390 mm
W	1565 mm	1755 mm	1985 mm	2190 mm
H	1400 mm	1590 mm	1820 mm	2100 mm
*CH	2010 mm	2200 mm	2430 mm	2710 mm
Minimum Hole Size (L x W x H)	(2680mm x 2165mm x 2300mm)	(2880mm x 2355mm x 2490mm)	(2880mm x 2585mm x 2720mm)	(2990mm x 2790mm x 3000mm)

* CH = Combined height of Graf tank and dome – excluding adjustable telescopic

Graf Carat rainwater storage tank

4. Tank structure

1. Cover

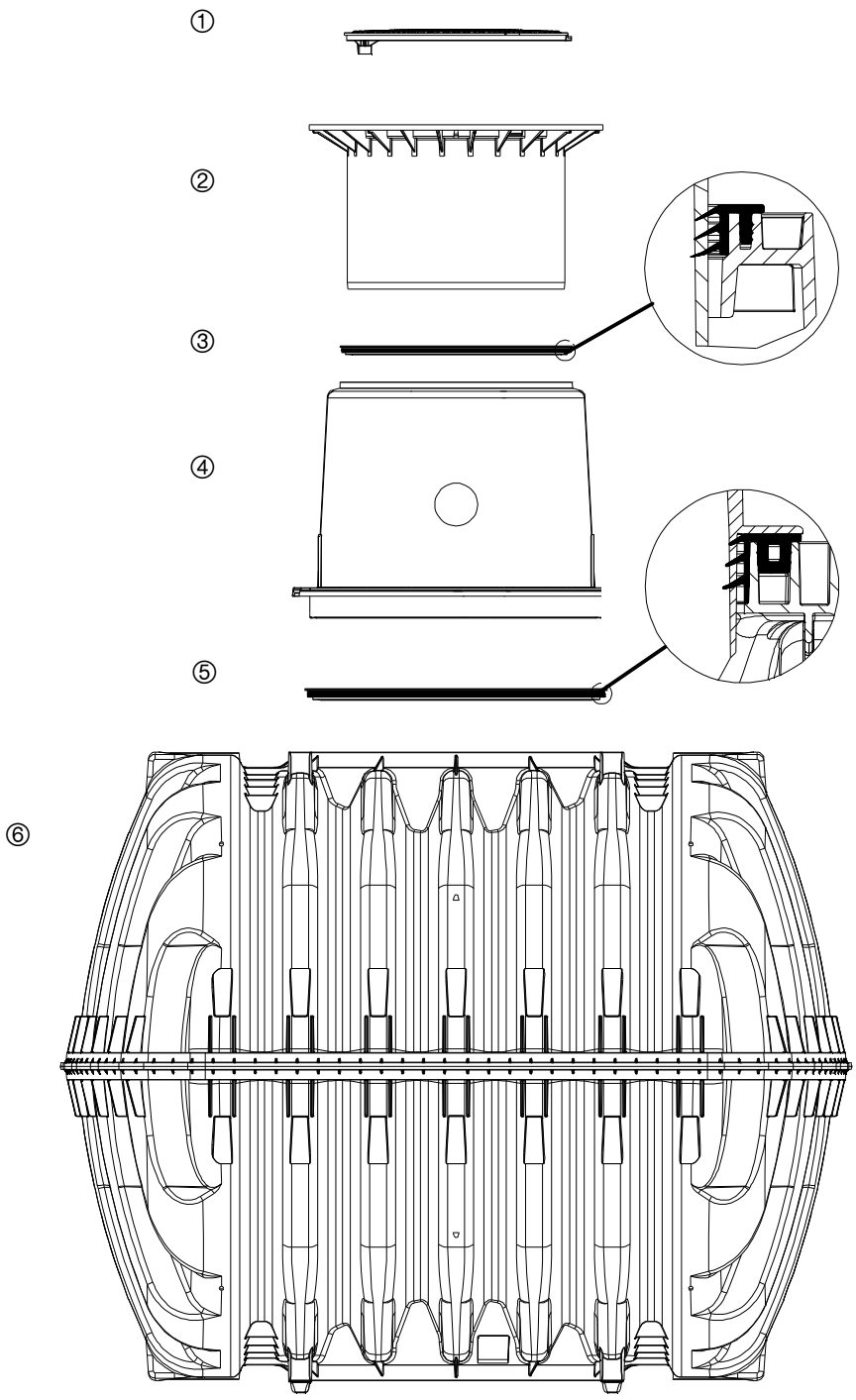
2. Telescopic dome shaft (can be inclined by 5°)

3. Profile seal

4. Tank dome

5. Tank - tank dome seal

6. Carat underground tank



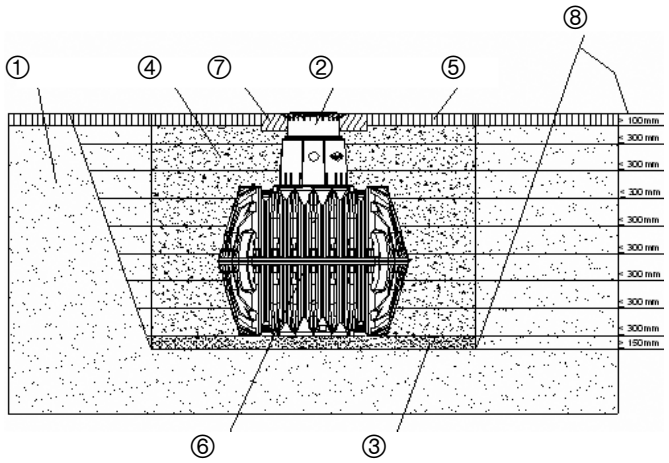
5. Installation and assembly

Diagram 5.1

Excavation and manual tampering/compaction details

1. Natural earth
2. Telescopic shaft
3. Level compacted foundation
   – 20mm porous crushed rock (Type B) (see page 1)
4. Surrounding
5. Finished ground level
6. Carat underground tank
7. Concrete layer for vehicular traffic surfaces
   Refer diagram 6.5
8. Trench battering as per local regulations

Note: Hole must be compacted in 300mm layers



5.1 Tank assembly

1. Insert the profile seal ① into the sealing ② groove in the lower half of the tank shell ④.

   Refer diagram 5.1.1

2. Insert the plastic locating pins ③ into the holes provided around the lower half or the tank shell.

   Refer diagram 5.1.2

   Lightly coat the seal ① with the supplied tube of liquid soap.

3. Position the upper half of the tank shell ⑤ onto the lower half ④ and install the quick connectors ⑥. To do this, every second quick connector is secured in a clock-wise direction using a hammer and a wooden block. The remaining quick connectors are then installed in a counter clock-wise direction.

   Refer diagram 5.1.3

Attention: When positioning the upper half tank shell on top of the lower half tank shell make sure under all circumstances that the seal does not slip out of the sealing groove.

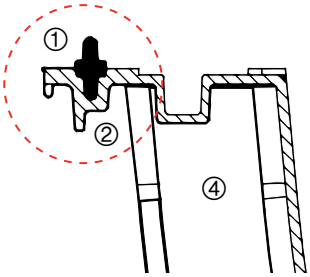


Diagram 5.1.1

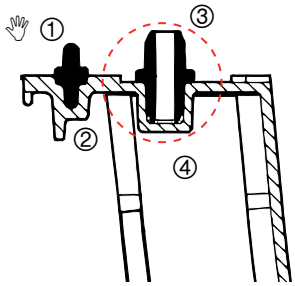


Diagram 5.1.2

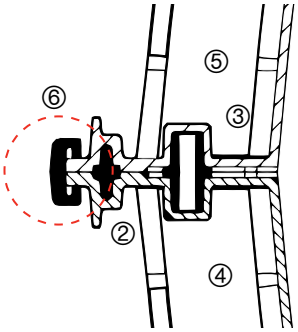


Diagram 5.1.3

5.2 Construction site pre-check

The following points should be clarified before installation commences:

- The structural suitability of the ground (geotechnical report recommended)*
- Maximum groundwater levels which occur and drainage capability of the subsoil
- Types of load expected, for example: traffic loads
- Location of all underground services

*A geotechnical report conducted by civil testing engineers is strongly recommended to determine the physical characteristics of the subsoil before installation/ excavation commences. For set back distance from neighboring boundary and any buildings, please contact local council.

5.3 Trench excavation

Ensure sufficient space, (not less than 300mm) is available for working around the tank during installation. Excavated soil must be kept well clear of the hole to prevent cave in.

The distance from solid constructions must comply with local regulations; refer to the current Building Code of Australia (BCA) – "angle of repose". The trench embankment must be designed so that slippage or collapse of the embankment wall will not occur. As each state or territory Occupational Health and Safety legislation differs in relation to trenching, reference should be made to your state or territory legislation with respect to trenching. A level layer of mechanically compacted Type B crushed rock (depth approx.100mm - 150mm) is applied as the foundation of the excavation. The depth of the trench must be calculated so that the maximum earth coverage (see Section 2 Depth of soil cover) above the tank is not exceeded. Installed plumbing pipes shall comply with AS3500.1:2003

Note: The Graf tank must not to be concreted into place.

5.3.1 Groundwater and impermeable soil types

Consideration must be allowed for the drainage of ground water if it is anticipated that the tanks will be immersed deeper into the groundwater than is shown in diagram 5.3.1 (shaded area). Refer to table 5.3.1 for recommended maximum immersion depths.

Contact Reece for advice.

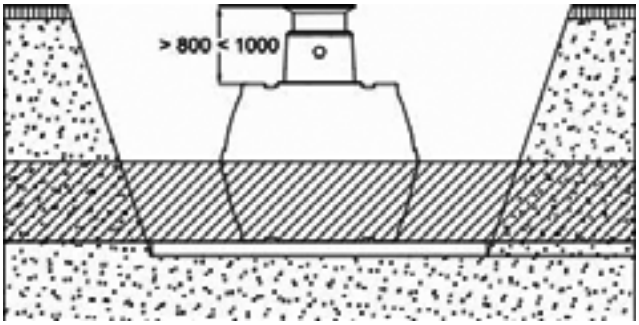


Diagram 5.3.1

In the event that ground water is evident at the base of the hole, place a 225mm piece of PVC in one corner of the excavation. Inside this PVC pipe insert a sump pump and drain the hole of ground water. (Leave pump running inside PVC pipe and do not remove until backfill is up to dome). Install tank. Back fill in 300mm layers. Once backfilling is up to dome, remove pump and then remove PVC pipe. Fill hole. Complete installation.

Table 5.3.1				
Tank size (L)	2700L	3750L	4800L	6500L
Immersion Depth (mm)	700mm	795mm	910mm	1050mm

5.3.2 Installation near to surfaces subject to heavy vehicle traffic

If the underground tanks are installed adjacent to surfaces which are used by vehicles heavier than passenger cars, the minimum distance (D1) away from these surfaces is at least the depth (D2) of the trench.

Note: Carat tanks must not be installed below areas used by vehicles heavier than passenger cars.

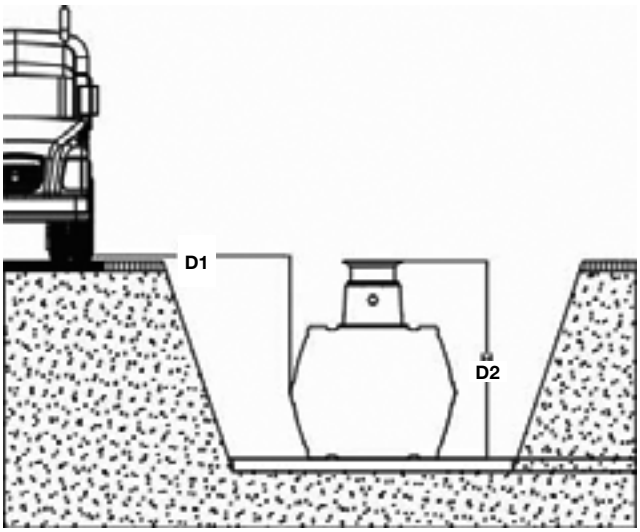


Diagram 5.3.2

5.3.3 Slope, embankment, etc.

On installation of the tank in the immediate vicinity (<5 m) of a slope, a statically calculated (by an engineer) supporting wall must be erected to absorb the soil pressure. The wall must exceed the dimensions of the tank by at least 500 mm in all directions, and must be located at least 1m away from the tank.

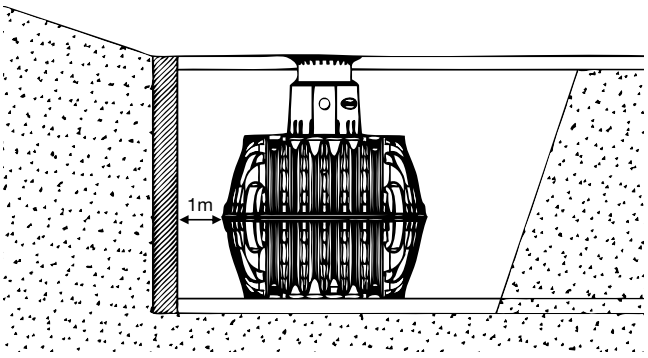


Diagram 5.3.3

5.3.4 Connection of several tanks

Tanks are connected by 100mm DWV pipes through special Graf seals (supplied). The top pipe is required for air and bottom is for water.

The holes that the pipe connect must be drilled to the corresponding size using only the 124mm Graf hole saw. Ensure that the distance between the tanks is at least 300 mm.

The pipes must project at least 200 mm inside the tanks.

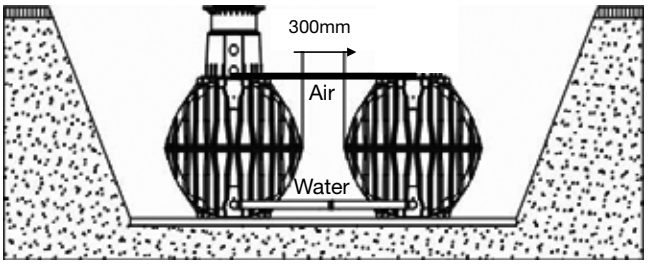


Diagram 5.3.4

Note:

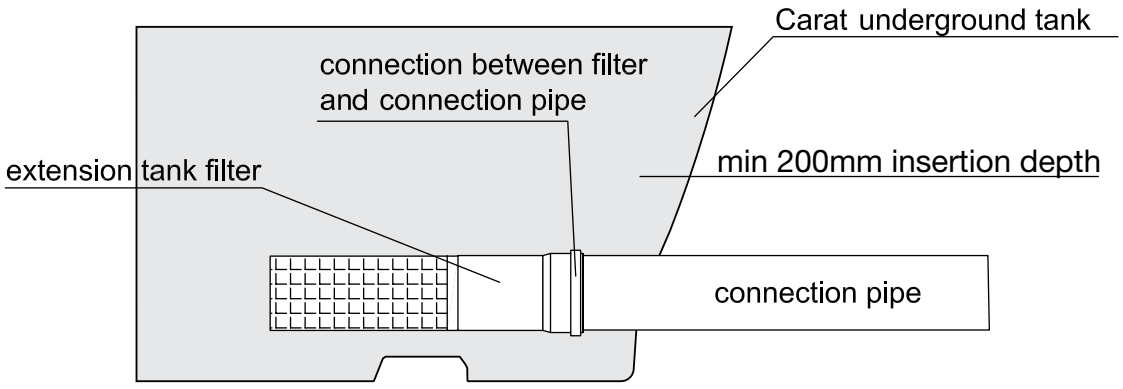
- Reece supply all Graf tanks used for extension with pre-drilled holes. Hole configuration must be ordered before the delivery of the tank.
- It is recommended that when manifolding tanks an additional filter should be installed between the primary and extension tank. This filter is available as an optional extra:

  Product Code 9501253: GRAF INTERNALEXTENSION TANK FILTER (REFER 5.4)
- If installing extension tanks check inter connection joints and all rubber seals for damage and ensure they are installed correctly and all pipes are inserted the minimum 200mm before backfilling occurs.

Note:

- Use only supplied liquid soaps as lubricant when inserting pipes.

5.3.5 Assembling the optional Internal Extension Tank Filter



5.4 Placement and filling of tank and trench excavation

The tank must be lowered impact free into the prepared trench excavation using suitable lifting equipment. As Occupational Health and Safety legislation differs in each state or territory reference should be made to your state or territory Occupational Health and Safety legislation with respect to lifting equipment.

1. To avoid deformities to the tank shell, the tank must be filled 1/3 with water before backfilling the surrounding trench.
2. The surrounding area of the excavation is filled in layers (maximum 30 cm steps) of appropriate fill as per Page 1. The individual layers must be well tampered/compacted by hand held machine. Damage to the tank must be avoided during tampering/compacting of backfill.

Note:

- Place dome onto tank before adding water or backfilling.
- Under no circumstances backfill the trench directly from the tip truck
- Ensure all tank opening are sealed before backfilling.
- Only hand held mechanical compaction machines are to be used

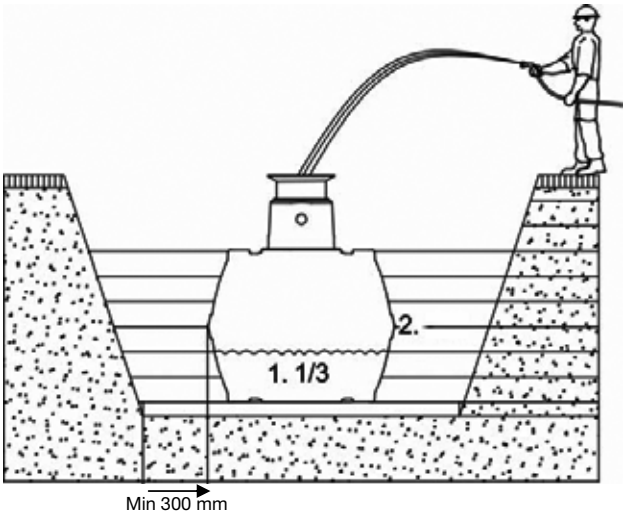


Diagram 5.4

5.5 Plumbing of feed and overflow pipes

All feed and overflow drain pipes must be laid on a grade of at least 1% in the direction of flow. Subsequent settling is possible and must be considered.

The tank overflow is connected to stormwater, it must be protected against reflux by using a suitable and accessible non-return valve and be in accordance with local regulations.

5.5.1 Suction, pressure and control lines

All suction lines, pressure and control lines must be installed through suitable 100mm pipe conduits.

The pipes need to be laid as straight as possible and with a grade of at least 1% in the direction of the tank.

If necessary, long radius (5 times diameter) moulded electrical conduit bends should be used.

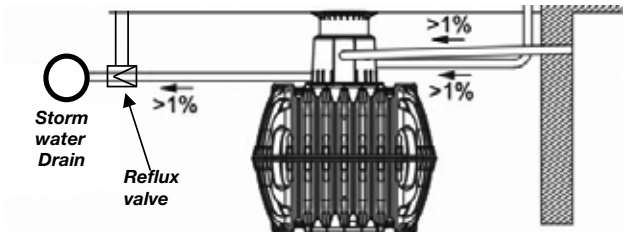
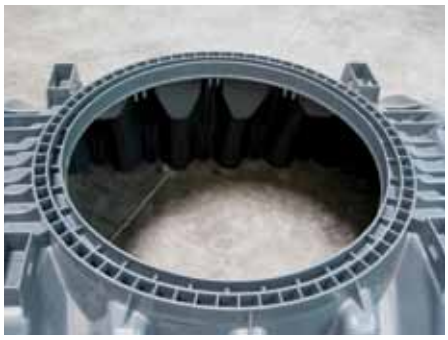


Diagram 5.5

Depth of drainage pipes to storm water and location from tank dome will vary according to filter selected.

6. Assembly of the tank dome and telescopic shaft

6.1 Installation of the tank dome seal



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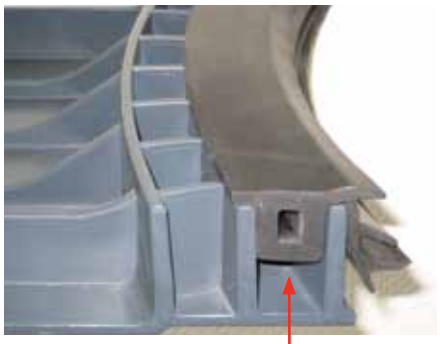
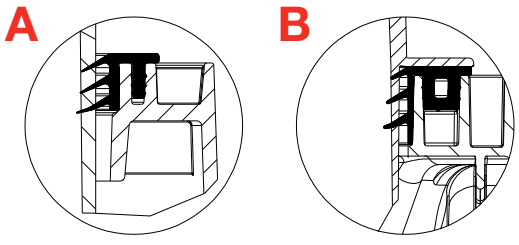


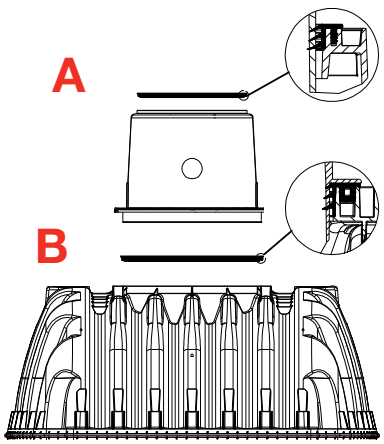
2.

3.

6.2 Assembling the tank dome and seals

Prior to assembly, the enclosed seal is inserted into the tank domes' groove "B". The tank dome is then aligned with the piping connections and is pushed into to the tank neck. It is essential to make sure that the upper seal "A" is correctly installed.





6.3 Assembly of the Telescopic Dome Shaft & PE Lid

For assembly purposes, the enclosed profile seal (A) is inserted into the tank dome's sealing groove and is coated generously with the liquid soap, supplied (do not use mineral oil-based lubricants, as these attack the seal). The telescope is then lubricated, inserted and aligned with the ground level. As legislation differs from each state or territory reference needs to be made to Occupational Health and Safety legislation pertaining to confined spaces and working at heights.

The telescopic pushes into the dome and is adjustable between 140mm and 340mm (standard shaft) and 140mm and 440mm (vehicle shaft). In the event that the shaft is too long it can be cut off to suit. The cut may require chamfering around the edge that fits into the rubber seal of the dome.

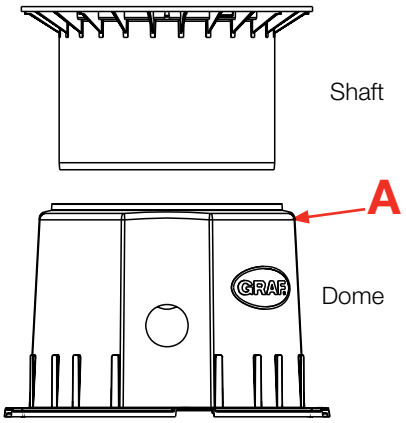


Diagram 6.3

6.4 Assembly of the telescopic tank shaft suitable for pedestrian traffic

Important: To prevent loads from being transferred onto the tank, appropriate fill as page 1. ② is manually filled in and evenly tampered/ compacted, in layers around the shaft ①. Damage to the tank dome ③ and telescope must be avoided. The lid is then positioned, tightened and sealed to prevent unauthorised entry.

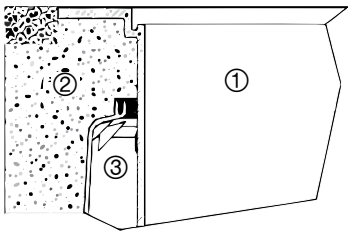


Diagram 6.4

6.5 Assembly of the telescopic dome shaft suitable for passenger vehicle traffic

If the tank is installed in areas used by passenger cars, the collar area of the shaft ① must be supported with concrete ④ (load rating = 250 mPa). The layer of concrete to be installed must be at least 300 mm wider in radius than the top of the shaft and not less than 200 mm deep all around.

The minimum coverage above the shoulder of the tank must be 800 mm (max. 1050 mm with shaft, coverage up to max. 1200 mm possible with the optional extension riser).

Attention: Always use the **cast iron cover** option where installations are subject to passenger vehicle traffic. As cast iron lids weigh 50kg the property owner may decide to choose one of the eternal Graf Filters as an option. See Pages 17-22.

For Installations requiring Type D covers for heavy vehicles please contact Reece Product Specialist for advice.

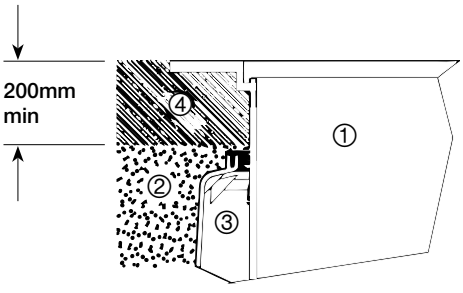


Diagram 6.5

6.6 Assembling the optional extension risers

For Graf tanks buried deeper in the ground, optional extension risers are needed to extend the shaft to the surface. To assist the insertion of the adapter into the tank dome, liquid soap (supplied) is required. The profile seal is inserted into the highest groove on the inside of the riser and lubricated generously. Push the telescopic shaft into the riser and adjust it to the planned height of the surrounding surface.

One riser fitted equals a maximum earth-cover of 1200 mm.

Note: Due to access of the filter, a Graf external filter is recommended. See pages 17-22.

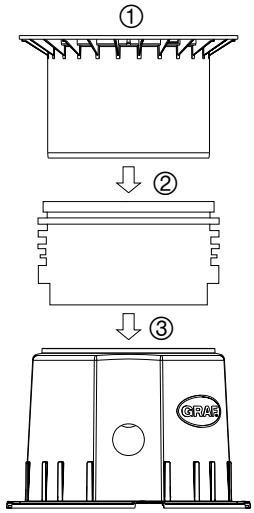
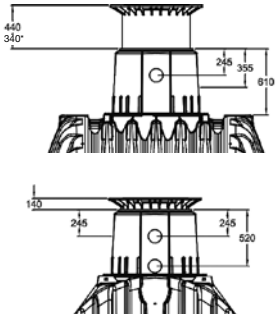


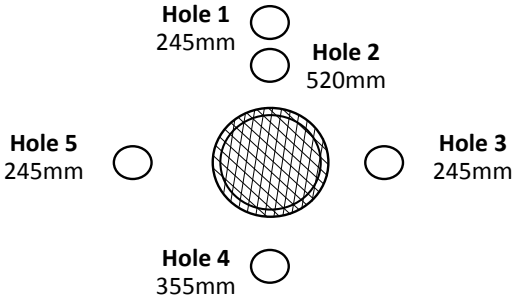
Diagram 6.6

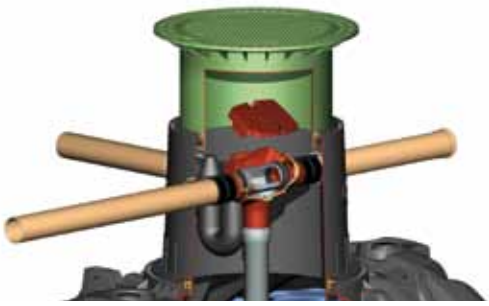
1. Telescopic shaft (can be adjusted up to 5° from horizontal, to suit undulating ground)
2. Extension riser
3. Tank dome (can be rotated by 360°) maximum adjustment 300mm

6.7 Correct use of Graf Dome Holes

Note: Use only supplied liquid soaps as lubricant when inserting pipes.





	Minimax Filter
Filter Installation locations	
Hole 1	Electrical leads & cables inside 100mm DWV as conduit
Hole 2	Tank water from/to pump and Vada Rain2Main
Hole 3	Water inlet from roof
Hole 4	Heavy Storm Emergency overflow siphon to storm water
Hole 5	Overflow to storm water

Storm Water Outlet and Heavy Storm Emergency Overflow Siphon are joined together down stream of the tank

7. Inspection and servicing

The entire system must be inspected for leaks, at the completion of the work. Settling of soil might occur and consideration needs to be given to allow for such.

Depending on local conditions the system may need to be serviced at regular intervals, but not exceeding 5 years. In this case, all parts of the system should be cleaned thoroughly and their function checked. Servicing should be carried out as follows:

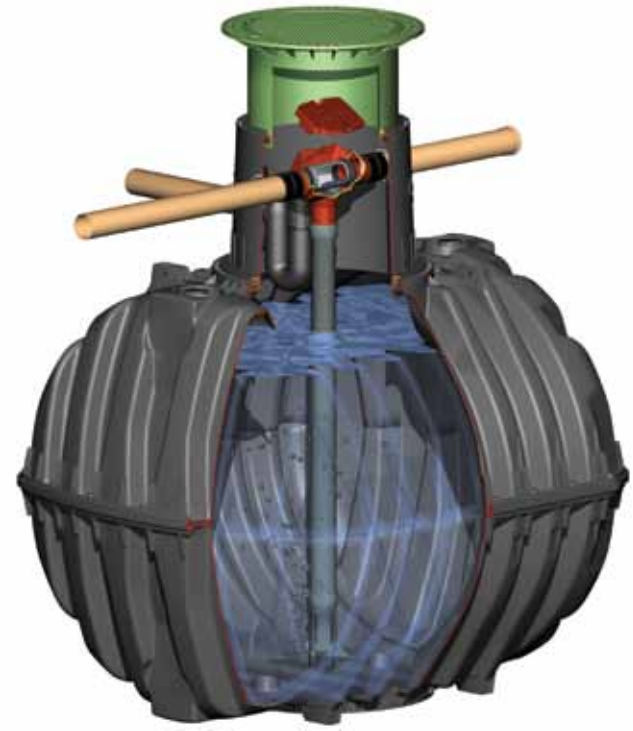
- Isolate water and power connections
- Drain the tank
- Clean surfaces and internal parts with clean water
- Remove any dirt/debris from the tank
- Check that all internal parts are properly positioned and firmly seated

In the event of work carried out inside the tank, as Occupational Health and Safety legislation differs from each state and territory, reference needs to be made to Occupational Health and Safety legislation pertaining to confined spaces.

Note: Please refer to safety notes and General Safety Instructions at the front of this installation manual.

GRAF MINIMAX FILTER UP TO 350SQM

INSTALLATION INSTRUCTIONS



2 Year Warranty

Graf Minimax Filter

1. Installation Conditions

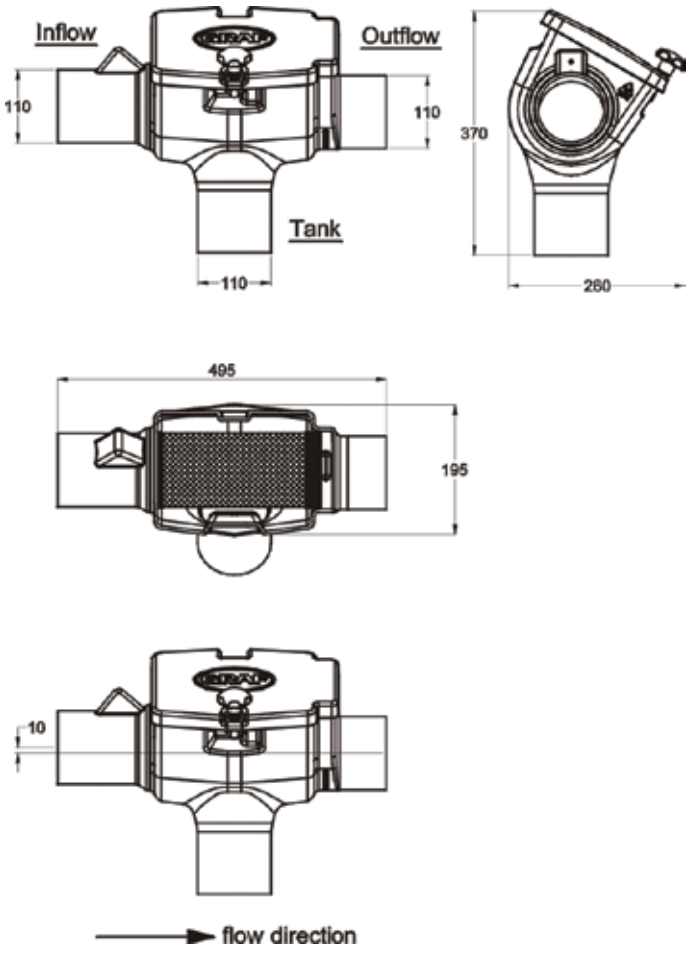
1.1. Minimax Internal Filter

For use in any installation including flat ground situation and/or where mosquito infestation may be an issue.

- The difference of level between inflow and outflow is 10mm.
- The filter is suitable for roof areas up to 350 square metres.
- The mesh width in the sieve insert is 0.35mm.

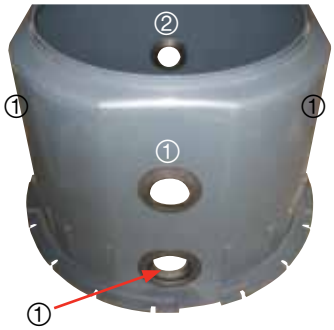
2. Technical Specifications

Dimensions:



3. Minimax Overflow Siphon Installation

3.1 Installation of tank dome seals



*Seals must be capped or covered to protect from damage during back fill.

These seals are to be installed from the outside in

This seal is to be installed from the inside out

3.2 Installation of the overflow siphon

The Heavy Storm Emergency Overflow Siphon is installed in the hole 355mm from the top of the dome. This open fitting allows for the removal of pollen oils which float on the surface of the water. This helps improve the quality of the water.

The rodent guard is installed in the DN 100 coupling on the emergency overflow pipe and is secured in place by the pipe section to be connected.

3.3 Filter Installation

Connect the filter body into the bell end of 100mm PVC pipe. Cut the pipe to the required length (see chart below) and connect it with the inlet stilling rubber ring adaptor with slots ensuring it is firmly in place.

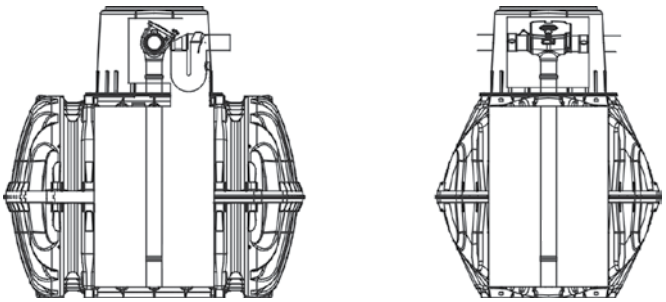


Diagram 3.3

Table 3.3				
Tank size (L)	2700L	3750L	4800L	6500L
Pipe length (mm)	1338mm	1518mm	1748mm	2038mm

3.4 Insert the filter package into the tank

Insert the assembled filter package in the tank. Fix the filter into place using the two Graf Spannfix collars. See picture on Page 15.

3.5 Installation of spray cleaner

The spray cleaner is designed to reduce the number of times the filter requires maintenance as it provides a jet spray of water into the filter cartridge. It can be hooked up to the pump line or mains pressure.

4. Commissioning

Before installation remove the rubber seals and clean the filter sieve in a dishwasher (40˚ – max. 60˚).

Any dirt that gets into the filter housing during the assembly must be thoroughly removed.

Due to the designed structure, the filter sieve functions only in one flow direction, the direction is marked on the metal ring with an arrow on the inlet side.

When installing the filter cartridge pay attention that the joint seam of the sieve surface is positioned upward.

5. Regular Maintenance

To ensure maximum water yield, the filter must be checked for dirt and debris immediately following the first rainfall occurrence after the tank installation. It must also be checked after any "major" rainfall event and after any long dry spells.

The complete system is to be inspected at least every 3 months for leakage, cleanliness and stability. To ensure the expected water yield is delivered, it is important to inspect and clean the filter sieve at regular intervals. When carrying out a service of the integrated filter it is also required that the overflow siphon is checked and cleaned.

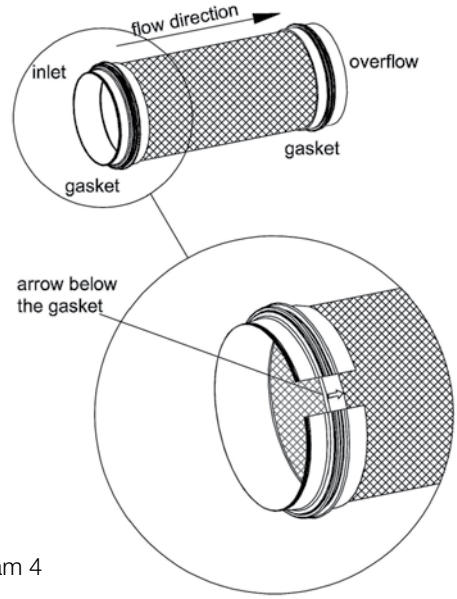


Diagram 4

GRAF UNIVERSAL EXTERNAL FILTER 350–500SQM

INSTALLATION INSTRUCTIONS

Subject to plumbing requirements the Graf Universal External Filter is suitable for installation with all brands of underground rainwater tanks. Suitable for soak well.

2 Year Warranty

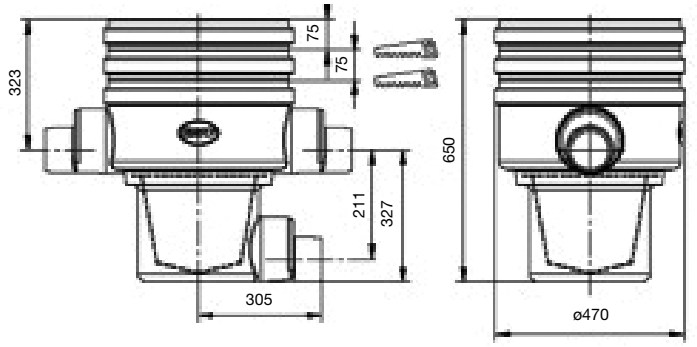
Installation and maintenance instructions

1. Installation requirements & performance specifications

1.1 Universal – External Filter pedestrian weight resistant

- The Filter with the green telescopic attachment and cover may only be installed in garden areas that are not traversed by traffic.
- The amount of short-term load of the polyethylene cover is max. 150 kg, the long-term area load max. 50 kg
- The maximum installation depth to the filter bottom is 1050 mm.
- Roof areas provided with a pipe connection of DN 100 = 350 m² and for DN 150 = 500 m².
- 100% water yield (ideal for small roof areas)
- Variable installation depth (570mm – 1050mm)
- Lockable, child proof cover
- Minimum height offset (270mm) between inlet and outlet
- Filter insert mesh 0.35mm

2. Technical Data



2.1 Graf External Filter Installed on a Graf Carat Tank

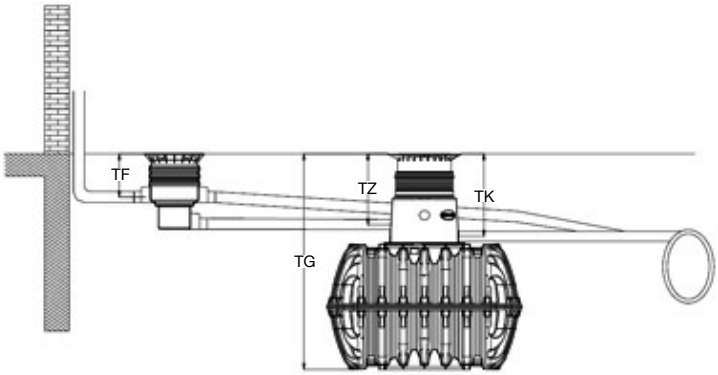


Table 3.1				
Tank size (L)	2700L	3750L	4800L	6500L
TFmin	300	300	300	300
TFmax	750	750	750	750
TGmin	2250	2440	2670	2950
TGmax	2600	2790	3020	3300
TZmin	595	595	595	595
TZmax	945	945	945	945
TKmin	760	760	760	760
TKmax	1165	1165	1165	1165

All dimensions in mm

3. Excavation, Commissioning & Servicing

3.1 Preparation of the excavation

So that sufficient working room is available and the filter can be correctly installed, the surface area of the excavation should exceed the filter dimensions on all sides by approximately 50 mm. The excavation hole must be level and smooth. The depth of the excavation must be measured so that the final installation depth of the filter bottom is at a maximum 1050 mm. The base of the hole requires a layer of smooth sand approximately 10 mm deep.

Important: To ensure optimal performance the surface that the filter sits on must be level.

3.2 Placing in the excavation and laying the connections

The filter is installed in the prepared excavation and is then connected to the relevant pipes etc.

Attention: It is important that all the pipes to be installed have a gradient of at least 1% in the flow direction without sagging or bending downward. The emergency heavy storm run-off connection run-off must be connected so that a congestion or back surge may be avoided.

Important: The diameter of the supply pipe = the diameter of the run-off pipe.

3.3 Telescope installation

The telescope is pressed into the filter housing from above. For excavation depths < 930 mm the telescopic attachment and in some circumstances, the filter housing must be shortened. It is important to ensure that the inlet pipe is not obstructed in any way by the telescope when installed.

Before pushing in the telescope the profiled sealing ring is placed in the housings recess. The telescope and the sealing ring must be thoroughly coated with the lubricating soap included with the filter (use no lubrication that is mineral oil based).

Attention: If the lubricating soap becomes dry and the telescope becomes difficult to move then there is the danger that the sealing ring will be forced out of its recess. Before back filling, the sealing ring must be checked once again that it is seated correctly in position. The telescope must be sufficiently embedded and supported that no forces are transferred to the housing of the filter.

3.4 Back Filling

Important: Before and during the filling, the horizontal position of the filter must be checked. Smooth washed sand is required as backfill and must be tampered down lightly with a compacting machine or hand held tamper in 30cm layers. Care must be taken during the embedding to ensure the filter is not damaged. To ensure that no forces are applied to the filter housing, the telescope must be well embedded and compacted.

3.5 Commissioning & Servicing

Before commissioning and at every inspection, the lifting out handle must be positioned at 90° to the inlet so that no large objects such as leaves and twigs can catch on the handle. The strainer filter basket is removed for cleaning and must be thoroughly cleaned with water until all the pores are open. It is advised to clean every 4 to 5 weeks (more often in autumn due to more leaves and twigs) or according to requirements.

The filter strainer basket must be lightly pressed into place taking care that the seal sits precisely after every cleaning.

At the occasion of each inspection, the overflow siphon must be checked and flushed out as necessary.

GRAF OPTIMAX PRO EXTERNAL FILTER 350–750SQM

INSTALLATION INSTRUCTIONS

Subject to plumbing requirements the Graf Optimax External Filter is suitable for installation with all brands of underground rainwater tanks. Not suitable for connection to soak well.

2 Year Warranty

Graf Optimax Pro External Filter

1. Installation requirements & performance specifications

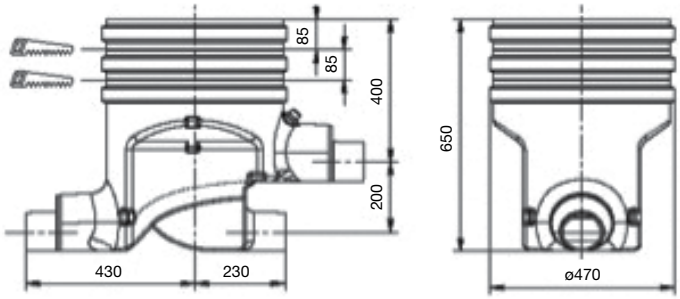
1.1 Optimax Pro – External Filter pedestrian area

- The Filter with the green telescopic attachment and cover may only be installed in garden areas that are not traversed by traffic.
- The amount of short-term load of the polyethylene cover is max. 150 kg, the long-term area load max. 50 kg
- Lockable child proof cover
- Variable installation depth 570mm to 1050mm.
- The Optimax Pro Filter is suitable for roof areas up to 350m² with DN100 connections and 750sqm with DN150.
- Filter insert mesh width .35mm
- Provides over 95% water yield
- Minimal height offset (200mm) between inlet and outlet

1.2 Installation and removal (lift out handle)

To facilitate removal of the filter unit in cases of deep installation, The removal – lift out handle (supplied) should be attached to the filter by using the screws of the upper connecting rod. See picture.

2. Technical Data



2.1 Graf External Optimax Pro Filter installed with a Graf Carat Tank

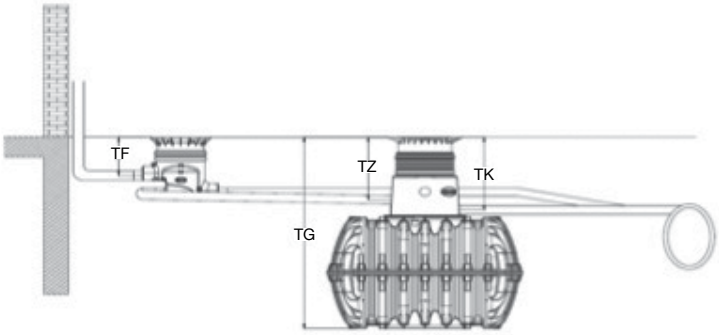


Table 3.1				
Tank size (L)	2700L	3750L	4800L	6500L
TFmin	350	350	350	350
TFmax	800	800	800	800
TGmin	2005	2395	2425	2705
TGmax	2600	2790	3020	3300
TZmin	550	550	550	550
TZmax	1000	1000	1000	1000
TKmin	715	715	715	715
TKmax	1110	1110	1110	1110

All dimensions in mm

3. Excavation, Commissioning & Servicing

3.1 Preparation of the excavation

So that sufficient working room is available and the filter can be correctly installed, the surface area of the excavation should exceed the filter dimensions on all sides by approximately 50 mm. The excavation hole must be level and smooth. The depth of the excavation must be measured so that the final installation depth of the filter bottom is at a maximum 1050 mm. The base of the hole requires a layer of smooth sand approximately 10 mm deep.

Important: To ensure optimal performance the surface that the filter sits on must be level.

3.2 Placing in the excavation and laying the connections

The filter is installed in the prepared excavation and is then connected to the relevant pipes.

Attention: It is important that all the pipes to be installed have a gradient of at least 1% in the flow direction without sagging or bending downward. To effectively reduce the rate of flow of the incoming water, about 2 metres of 100mm horizontal pipe should be installed before the filter. This has the effect of improving filtration and so increasing the amount of water able to pass through the filter into the tank.

Important: The diameter of the pipe from the filter to the tank must be 100mm. The diameter of the incoming supply pipe to the filter (100/150mm) must equal the diameter of the pipe to stormwater (100/150mm).

3.3 Telescope installation

The telescope is pressed into the filter housing from above. For excavation depths < 930 mm the telescopic attachment and in some circumstances, the filter housing must be shortened. It is important to ensure that the inlet pipe is not obstructed in any way by the telescope when installed.

Before pushing in the telescope the profiled sealing ring is placed in the housings recess. The telescope and the sealing ring must be thoroughly coated with the lubricating soap included with the tank (use no lubrication that is mineral oil based).

Attention: If the lubricating soap becomes dry and the telescope becomes difficult to move then there is the danger that the sealing ring will be forced out of its recess. Before filling, the sealing ring must be checked once again that it is seated correctly in position. The telescope must be sufficiently embedded and supported that no forces are transferred to the housing.

3.4 Back Filling

Important: Before and during back filling, the horizontal position of the filter must be checked. Smooth washed sand is required as backfill and must be tampered down lightly with a compacting machine or hand held tamper in 30cm layers. Care must be taken during the embedding to ensure the filter is not damaged. To ensure that no forces are applied to the filter housing, the telescope must be well embedded and compacted.

3.5 Commissioning

Before commissioning the system the filter surface is to be thoroughly cleaned with a brush and a solvent based cleaning fluid. Alternatively the filter sieve may be cleaned in a dishwasher (40° max – 60°). Any dirt that gets into the filter housing during the assembly must be thoroughly removed.

3.6 Servicing

The complete system is to be inspected at least every 3 months for leakage, cleanliness and stability. The filter surface should be cleaned approximately every 3 months or according to local conditions.

PUMPS AND MAINS WATER INTERCONNECTION DEVICE

For pump and Vada Rain2Main installations please refer to manufacturer's instructions supplied with the unit.

vada

Graf recommends Vada pumps and mains water interconnection devices for use with their tanks.

Notes

Graf Carat Pictorial Installation Guide

1. Mark hole before digging

2. Level ground

3. Compact with hand held machine

4. Lift tank in halves

5. Inset profile seal and centring bolts

6. Liquid soap seal

7. Insert pump into base of tank before connecting tank top

8. Hammer in quick connectors

9. Lift tank into hole and recheck level

10. Insert dome seal

11. Push dome into postion and lube seal with liquid soap provided. Then insert shaft.

12. Backfill hole in 300mm layers, see page 1.

13. Connect plumbing

14. Install Graf filter and electrical connections

15. Complete landscaping

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