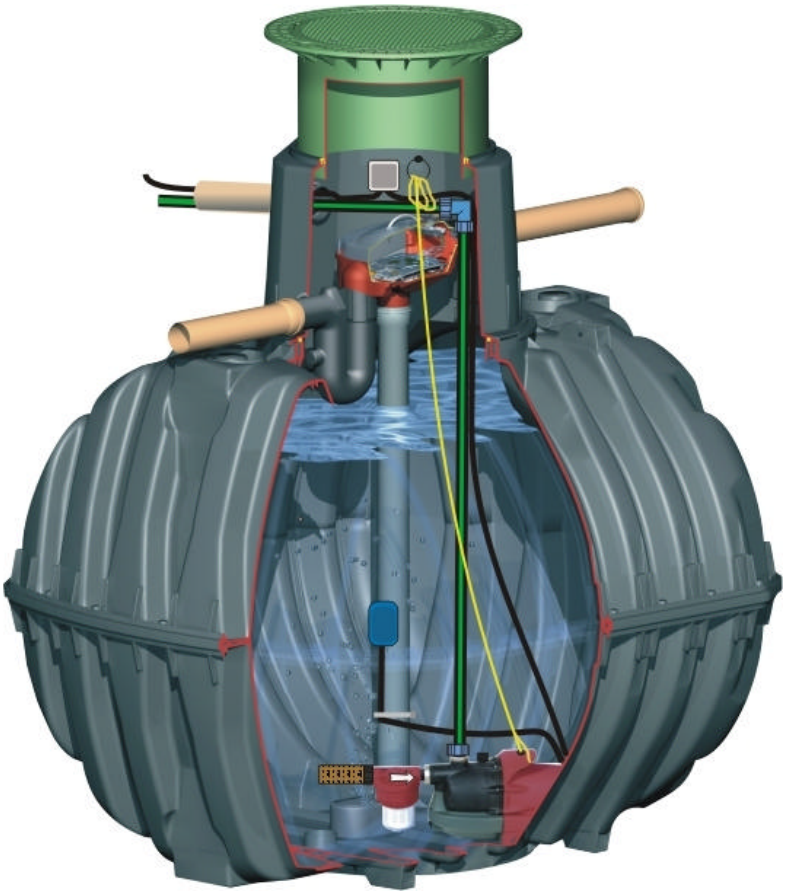
Installation guide

Graf Carat rainwater harvesting system with internal filter and **Rain Director®** or **Mains Backup in a Box®**



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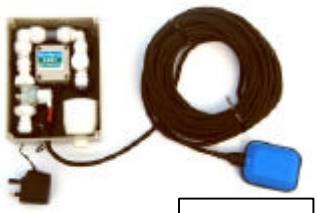

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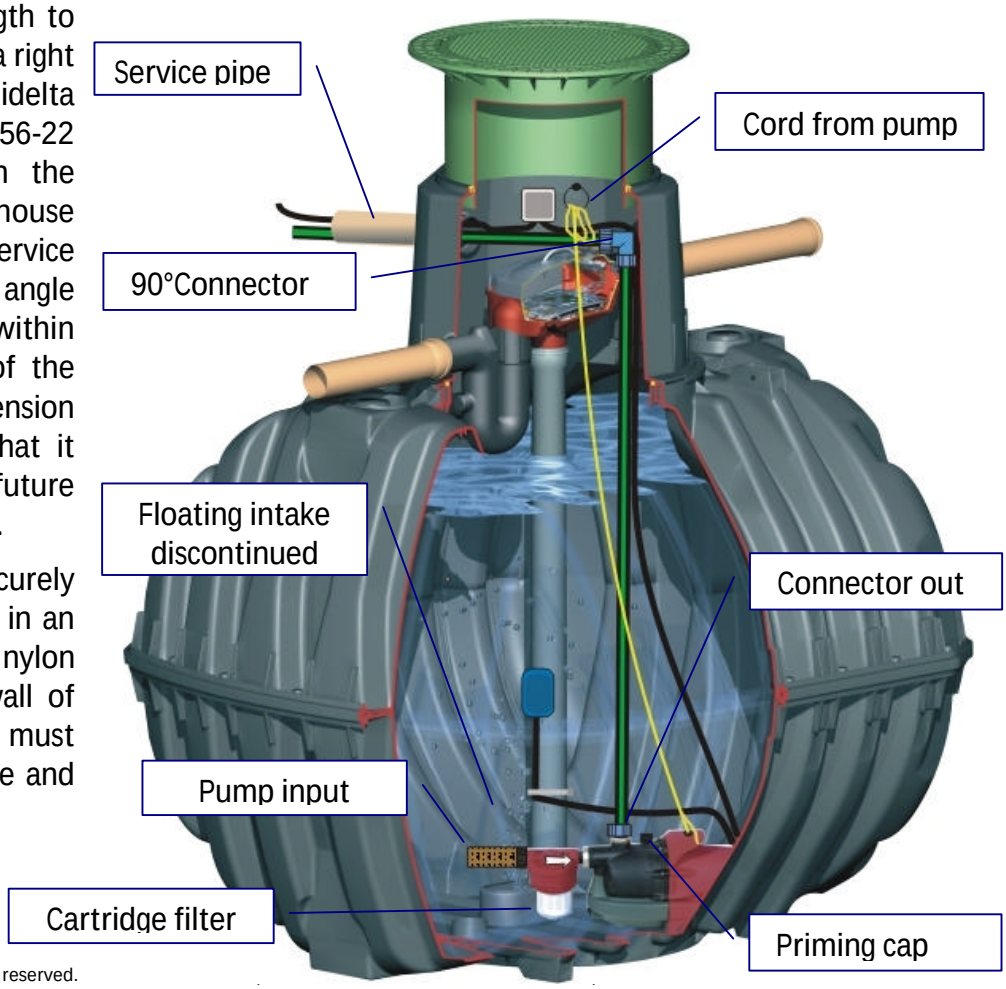
Rainwater harvesting system installation; outdoors

QUICK START

Systems with leaf filter in the turret of the underground tank and submersible pressure-sensitive pump, product ID numbers ending GUK1, DUK2, DUK3, DUK4 or DUK5

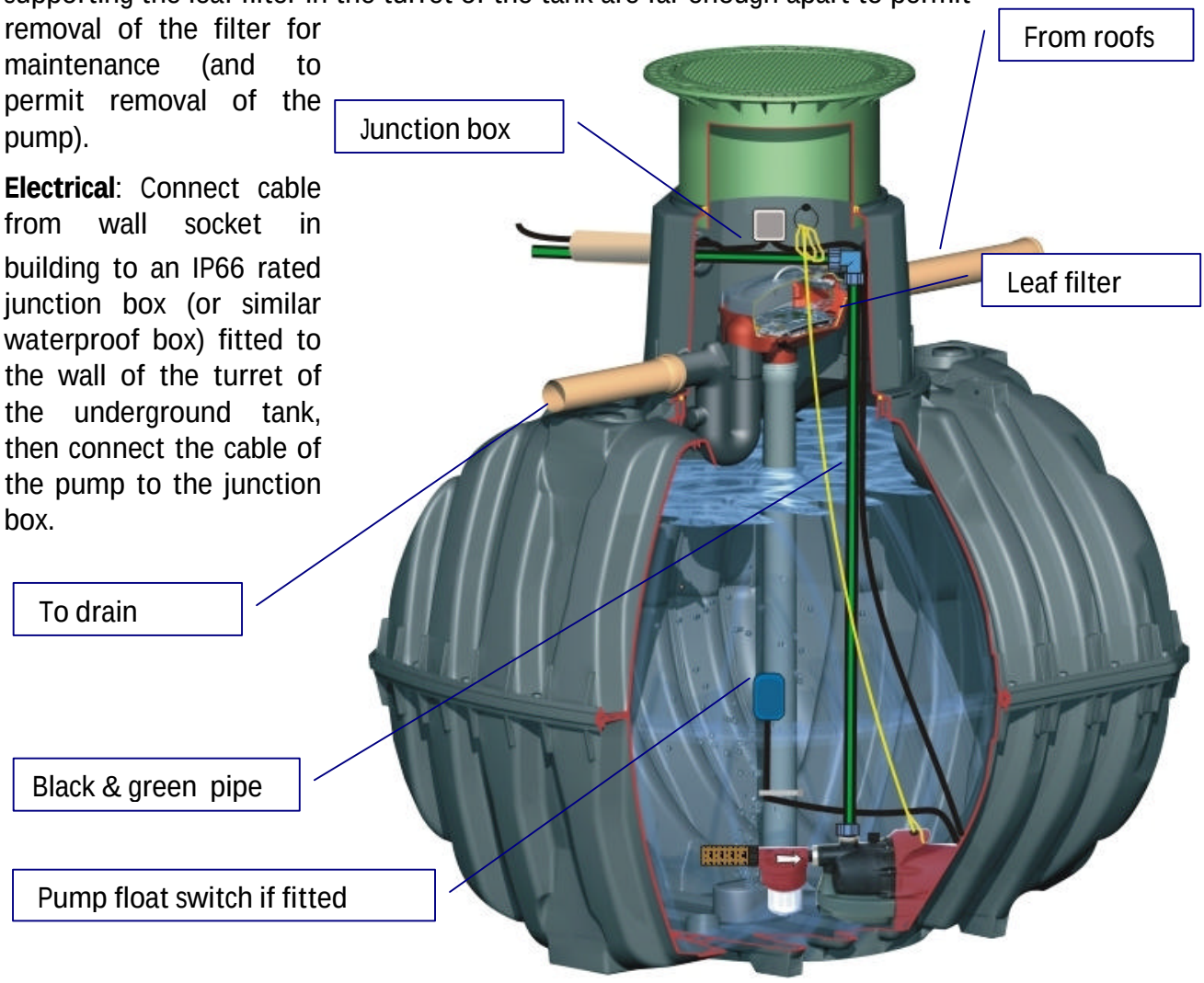
1. **Read in advance and follow the installation instructions provided with the system: your guarantee is affected if you do not install correctly.**
2. **Tank**: if the water table is within a metre of the surface of the ground you should strap it to a concrete plinth to prevent the tank, when empty, popping out of the groun. Otherwise backfill the tank to the shoulder with pea shingle (top soil round the turret).
3. **Dirt in tank**: Do not install or start the pump before all grit (building rubble) and plastic swarf are removed from the bottom of the tank with a separate dirty pump
4. **Pump input**: Screw the cartridge filter onto the input end of the pump with its arrow pointing towards the pump. Screw the 1 inch strainer (white plastic) onto the input of this filter. Do not use PTFE tape on the input side of the pump because shreds can get into the pump and invalidate warranty.
5. **Pump priming**: it is essential that the pump is primed by removing the half inch black cap and pouring 5 litres of water into the pump through a funnel; otherwise the pump can burn itself out even if submerged.
6. **Pump connections**: output pipe (usually 1inch MDPE or HDPE) runs out of the top of the pump and must be cut to length to run straight upwards to a right angle connector (Unidelta compression fitting 70-56-22 or similar) from which the pipe runs in to the house through the 4 inch service pipe. This right angle connector must be within 30cms of the surface of the ground (even if extension sleeves are fitted) so that it can be undone in the future for removal of the pump.
7. The pump must sit securely on the floor of the tank in an upright position, with its nylon cord attached to the wall of the turret. Outlet pipe must be sealed with PTFE tape and tightened securely.



PTO

QUICK START

8. **Pump float switch**: if the pump is fitted with a float switch, connect the cable with a nylon tie wrap to the pump output pipe such that the float is free to fall to just above the floor of the tank when rainwater runs out. If your system has a second float switch for the mains backup, its float switch must be adjusted so that it is higher than the pump's float switch (both in down (empty) position).
9. **Piping**: Use PTFE in all connections after the pump (but not before) to ensure pressure tight system. Most water company inspectors now require rainwater pipe to be black with green stripes. Ensure no pipes are exposed to the cold on arrival at building.
10. **Filter:** Ensure 4inch downpipe is correct length to bring leaf filter to correct level for the input and output 4inch pipes. Fit calmed inlet to base of downpipe. Ensure 4inch input and output supporting the leaf filter in the turret of the tank are far enough apart to permit removal of the filter for maintenance (and to permit removal of the pump).
11. **Electrical**: Connect cable from wall socket in building to an IP66 rated junction box (or similar waterproof box) fitted to the wall of the turret of the underground tank, then connect the cable of the pump to the junction box.



Installation instructions

These instructions aid assembly of the Graf Carat water tanks, associated plumbing and mains backup (if fitted), for supplying a domestic water system or garden use. Read these and the manufacturer's installation instructions (below) thoroughly before starting assembly. Your guarantee is affected if you do not install correctly

You should also have the instructions for your mains backup option (Rain Director® or Mains Backup in a Box®) prior to commencing. Each is delivered with the product but you can get a download at any time at

www.rainwaterharvesting.co.uk/downloads/raindirector_manual.pdf
and
http://www.rainwaterharvesting.co.uk/downloads/rain_backup_in_a_box.pdf

a) Tank assembly

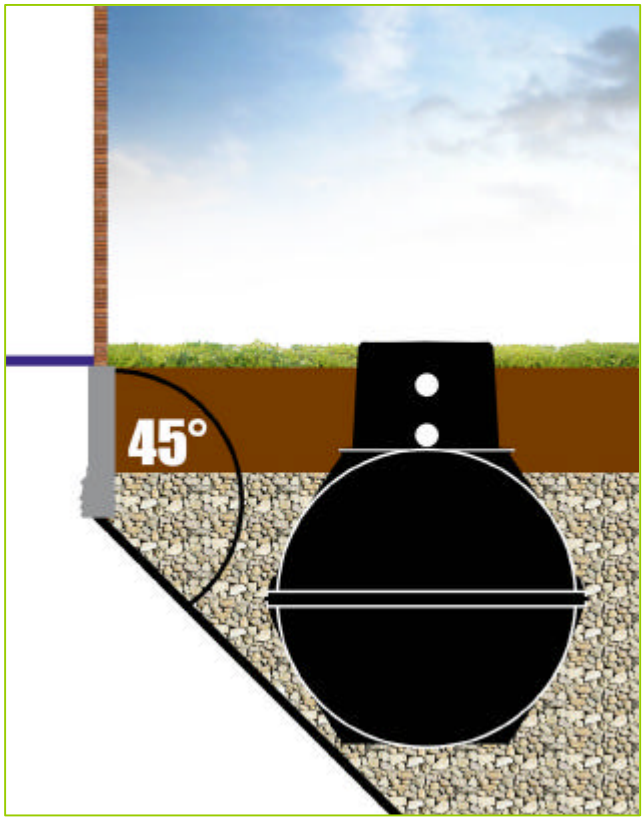
The GRAF Carat tank comes in two half shells, the upper of which has the aperture for the tank dome. We supply GRAF Maxi tank domes because we consider the Mini tank domes unsuitable for rainwater harvesting.

- Place the locating pins in the holes round the rim of the lower half, clean off every trace of grit and dirt from the joint surfaces, lubricate then fit the rubber profile seal in the groove round the perimeter. Turn the upper half to its correct orientation (two people needed, and maybe four with the 6500 litre size) and lower it onto the locating pins, making sure the seal mates with the upper and lower halves.
- The Graf-patented quick connectors (wedges) secure the two halves together (and can be disassembled if you choose). For the best results, work diagonally, in attaching the connectors, i.e. after the first, say, at 12 o'clock, secure a connector on the opposite side of the tank, at 6 o'clock. Then secure connectors at 3 o'clock and 9 o'clock etc. This ensures that the seal is compressed uniformly. Knock them each tight with a hammer.
- The tank dome seal sometimes needs to be rotated 90 degrees before it is apparent which way it goes. The single fin goes into the grove in the top of the tank. The triple fins point towards the centre of the rim and hold the dome (turret) when inserted. Mount the dome but leave the man-hole cover off for the time being.


Triple fins of the dome seal face inwards

- In the case of the extension sleeve (optional) the rubber seal should be fitted inside the extension before the green lid is offered up.
- The Graf Carat tank is supplied with the Graf Optimax Filter. The filter is a self-cleaning mesh filters. The holes in the turret of the tank are positioned to enable plug-and-play fitting of the filter without the need for any drilling

b) Installing the tank



Proximity to buildings. The tank must not be so close to any building that it compromises the structural integrity of the foundations. To assess this distance, draw a line on the side elevation plan from the point where the nearest wall meets the ground at an angle of 45 degrees downwards and away from the building. No part of the tank should be within this line.

Slope. On a sloping site the ideal position for the tank is on a low part of the land. Rainwater flows readily from all the gutters to the tank and the submersible pump can easily pump it back up round the building.

Depth. The maximum depth the tank can be installed is 1200 mm from Ground to top of tank excluding dome (turret). We do not support installations deeper than this because of the difficulty and danger involved in accessing such deep equipment. More than **one** Graf extension sleeve or a self made concrete inspection bay using concrete will invalidate warranty in terms of our technicians retrieving damaged or faulty parts. Ensure the hole is dug to a depth which permits the tank dome cover to be at the required level (usually ground level) even though the turret has a lot of leeway for final adjustment. Complete the mounting of the tank in its final position, leaving the surround of the tank dome free for piping.

Note: Do not back fill around the tank dome until the collection and soakaway plumbing has been installed.

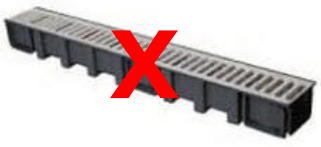
Back-filling. Read the manufacturers' installation instructions (below) thoroughly; the size of the hole and the procedure for filling with water when backfilling the outside of the tank are given there. The Carat tanks are strong enough that they do not normally need concreting in. Backfill to the shoulder of the tank with pea shingle and round the turret with spoil or top soil (installation under garden, Graf image page 7) or pea shingle all the way up (installation under concrete or driveway, Graf image page 5).

Concrete or not. To ensure that the underground tank, when empty, does not rise up out of wet ground:

a) **Dry soil**. Place tank directly on base of hole and backfill as above and according to manufacturer's instructions:

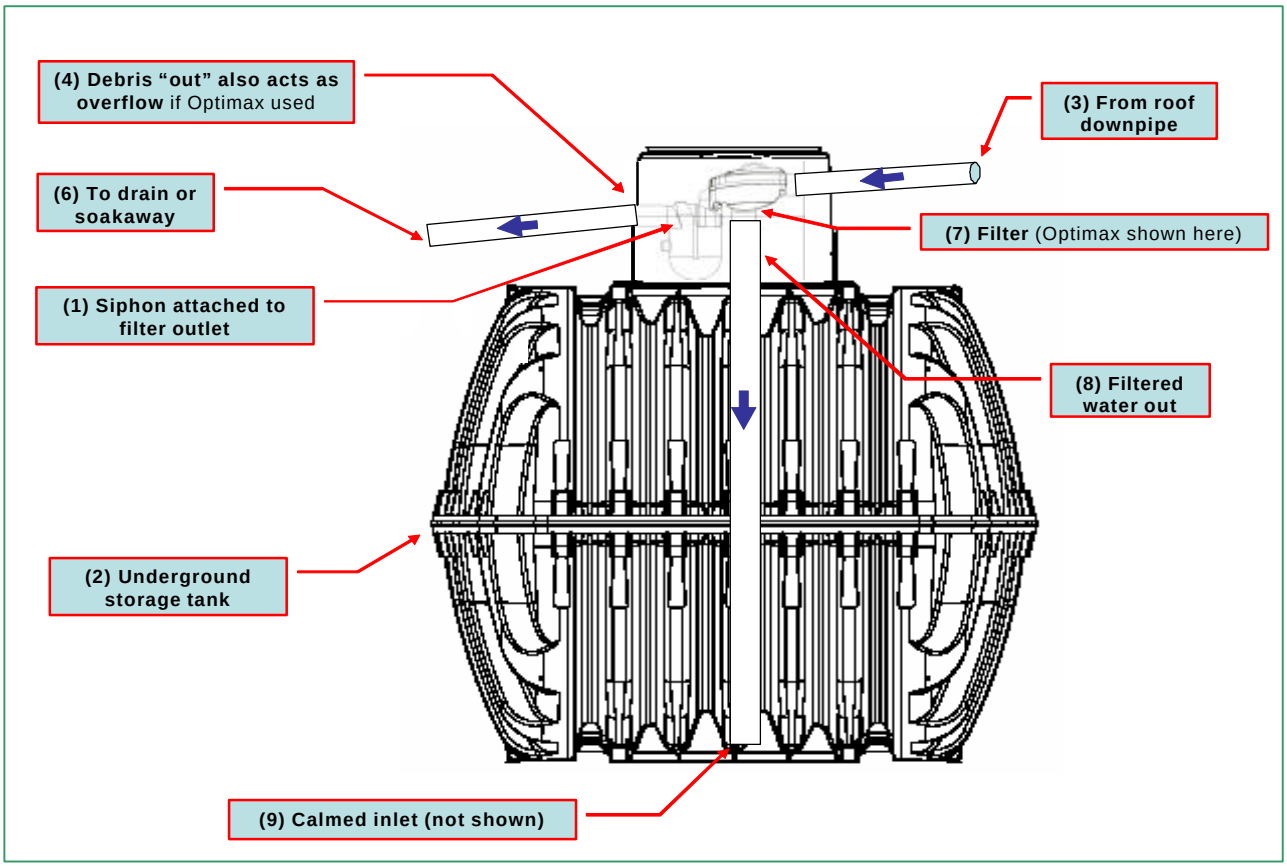
b) **High water table**. Lay a plinth of a sufficient amount of concrete to weigh the tank, when empty, down. Put eyelets in the concrete and strap the tank to the concrete at either end.

Surface Water. We advise against letting surface water run into the tank. Any spill or mess on the ground could get into the tank. Furthermore, grit and other debris can be destructive to the pump. Do not run the roof downpipes to the tank through a ground gutter.



c) Soakaway

It is vital for the self-cleaning function of the Optimax filter that water flows into the turret and out at a firm flow rate. If there is no main drain on site then ensure that the soakaway conforms to the following, as shown in the picture below:



1. The last metre of 110mm (4 inch) drainpipe **arriving at the filter** should have a **drop of 20 to 50 millimetres** (2-5%) to accelerate water flow, i.e. twice the gradient shown in the manufacturer's instructions .
2. The first metre of drainpipe **after the filter** should also have a **drop of 20 or 50 millimetres** to encourage flow away from the filter, whether or not the U-tube siphon (as a rodent and odour guard) is fitted.
3. If this overflow/debris outlet does not go to main drain the soakaway must be constructed to high standard and high volume.
4. The soakaway should be of a volume sufficient to ensure that water does not back up to the filter. The calculations should cater for heavy summer storms, and, for some council inspectors, one half of the annual rainfall on the roof (50% being considered as the largest possible storm in a ten year period). The soakaway must also

reach below any impervious layers so that the water flows away to ground within about a day.

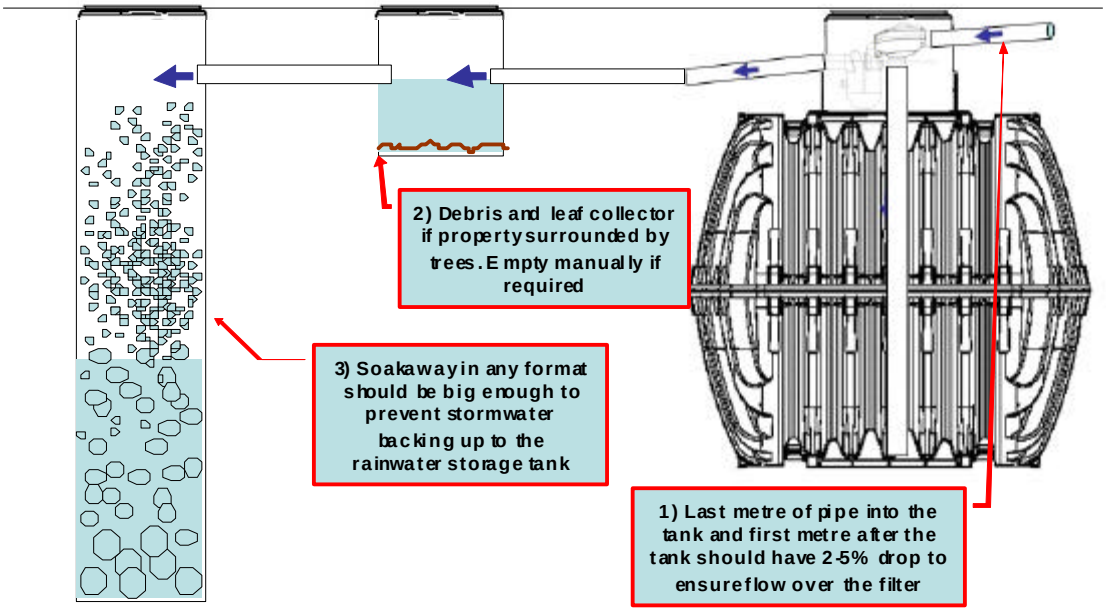
5. Where appropriate, the overflow/debris outlet pipe should be fitted with an anti-surcharge or anti-backflow device (BS 8515:2009, ¶ 4.9)

6. The soakaway should be at least two metres away from the tank (do not consider that back fill round the tank could be used as the soakaway).

7. We also recommend building a **one metre cubed leaf collection chamber** with manhole between the tank and the soakaway. If the inlet and outlet are close to the top of this collection chamber then bulky leaves will drop into the chamber and can be cleaned out of the chamber through the manhole every autumn. The soakaway then does not clog up with leaves.

Soakaway options

1) Last metre of pipe into the tank and first metre after the tank should have 2-5% drop to ensure flow over the filter.
2) If the property is surrounded by trees, fit a debris and leaf collector (breeze blocks or brick, say 1 metre cubed, with manhole) before the soakaway.
3) If the rainwater storage tank does not run out to a main drain, the soakaway must have capacity to ensure water does not back up to the leaf filter in the top of the storage tank, otherwise debris will flow into the stored rainwater. Soakaway can be cylindrical concrete piping 80 or 100 cms diameter, bore hole or any format but should be 1 to 2 times the volume of the rainwater storage tank



d) Fitting the submersible pump

1) The routing connections and inclines are shown in the manufacturers' instructions (below).

2) Clean out from the bottom of the tank any grit or debris which might have fallen there. Use a separate dirty pump.

3) Ensure the pump cartridge filter (if supplied) is attached to the inlet of the pump (usually entering the cylindrical pump housing from the narrow end) with its arrow pointing towards the pump. Screw the 1 inch strainer (white plastic) onto the input of this filter. Do not use PTFE tape on the input side of the pump because shreds can get into the pump and invalidate warranty. The floating intake (which might appear in out-of-date print material) has been discontinued because in some circumstances it permitted air to be sucked into the pump.

Connect the filter outlet marked OUT to the pump

4) The pump has a 25mm (1 inch) BSP fitting at its outlet, which point upwards. Use the pipe connector provided with the kit. Fit piping with rainwater markings of 32mm diameter (1¼ inch) from the outlet port of the pump. 25 mm pipe is acceptable but the wider the better. It is recommended not use copper or other rigid pipe here but to use a semi-flexible medium density polyethylene (MDPE) pipe between the pump outlet and the building supply connection.

5) **Priming.** Before lowering the pump into the tank, prime it by removing the black screw cap, inserting a funnel and filling it (about 5 litres of water required). Failing to prime in this way will burn out the pump and invalidate the guarantee.

Fill the pump with clean water (needs about 5 litres) and replace the cap

6) **Pump connections**: output pipe (usually 1inch MDPE or HDPE) runs out of the top of the pump (Enviro or Series 3 type) and must be cut to length to run straight upwards to a right angle connector (Unidelta compression fitting 70-56-22 or similar) from which the pipe runs in to the house through the 4 inch service pipe. This right angle connector must be within 30cms of the surface of the ground (even if extension sleeves are fitted) so that it can be undone in the future for removal of the pump. Note that it is <u>not</u> permitted under the Water Regulations to feed both mains and rainwater to the washing machine selectable by a two position cock (risk of backflow). To provide choice of water source at the washing machine, fit both the mains and rainwater pipes with the correct thread to permit the flexible pipe from the washing machine to be connected to either, manually.

Get the right fit for pipes and connectors with the following conversions:

½ inch:	13 mm
¾ inch:	19 mm
1 inch:	25 mm
1¼ inches:	32 mm

7) **Pump float switch**: if the pump is fitted with a float switch, connect the cable with a nylon tie wrap to the pump output pipe such that the float is free to fall to just above the floor of the tank when rainwater runs out. If your system has a second float switch for the mains backup, its float switch must be adjusted so that it is higher than the pump's float switch (both in down (empty) position).

8) Lower the submersible pump (with supply pipe and electric cable fitted), into the bottom of the tank, using a cord permanently connected to the pump. The pump must

sit securely on the floor of the tank in an upright position. Secure the cord to the inside of the tank dome so that you can pull the pump out for maintenance.

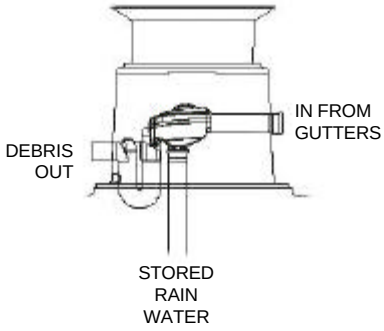
Route the pump output pipe and electric cable back to the house through the 4inch service pipe for which there is a third hole in the dome. Block the unused holes with the black plastic blanks provided. Ensure no pipes are exposed to the cold on arrival at building. Once the installation is completed turn on the pump to pressurise the system and check any connections for leaks (do this before back filling any buried pipes).
9)

10) **Electrical**: Connect cable from wall socket in building to an IP66 rated junction box (or similar waterproof box) fitted to the wall of the turret of the underground tank, then connect the cable of the pump to the junction box. It is recommended that the connecting cables are installed by a qualified electrician and any outside connections complying to IP66 ingress rating. For safety reasons these instructions must be carefully followed.

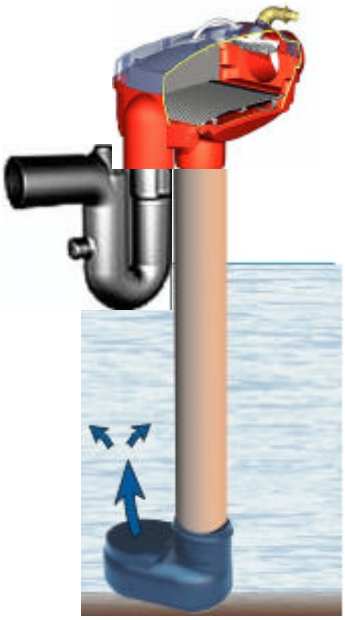
e) Fitting filter, siphon, calmed inlet

Follow the manufacturer's instructions (below) for fitting the Optimax Pro internal filter. Where some filters require a separate siphon, the overflow siphon here is incorporated in the Optimax overflow outlet U-tube.

The U-tube siphon outlet from the tank has two functions, 1) the leaf and debris outlet from the filter and 2) the overflow when the rainwater storage tank is full. Note that the third 110 mm (4 inch) hole in the turret is for the service pipe of this size back to the house in which the feed pipe from the pump and electric cable(s) can be channelled. It is the installer's responsibility to ensure that a) services to the house are secure and protected and b) connections in the turret permit the later removal of the filter, pump and other equipment for inspection, maintenance or replacement.



Ensure that the three 4 inch pipes arriving at the turret are fitted with the rubber seals provided with the kit.



Prior to fitting in the tank, connect the 4 inch (100 mm) downpipe to the filter and the calmed inlet (which prevents filtered rainwater from disturbing any sediment on the bottom of the tank) to the bottom of this pipe. Although the friction fit top and bottom is almost adequate we recommend adding a pair of self-tapping screws to keep the pipe in the filter and the calmed inlet on the pipe; this avoids losing on or more elements when it comes to pulling the filter assembly out of the tank for maintenance purposes.

Ensure 4inch downpipe is correct length to bring leaf filter to correct level for the input and output 4inch pipes. Ensure 4inch

input and output supporting the leaf filter in the turret of the tank are far enough apart to permit removal of the filter for maintenance (and to permit removal of the pump).

Place the filter assembly with U-tube in the centre of the tank with the calmed inlet on the bottom. Attach the filter input to the 4 inch rainwater pipe from the roof with the slip collar provided and the U-tube outlet to the 4 inch pipe to drain or soakaway, similarly.

Did you **prime the pump**? If not, take it out and do it now. See page 5.

f) Connecting the mains back-up

You should have the instructions for your mains backup option (or prior to commencing. Each is delivered with the product but you can get a download at any time:

Rain Director® www.rainwaterharvesting.co.uk/downloads/raindirector_manual.pdf

Mains Backup in a Box®) www.rainwaterharvesting.co.uk/proddetail.php?prod=RWH-BUB01

Note: if you are fitting a rain manager with integral pump, fitted inside the building, then there is no pump submerged in the tank.

Aquaprof rain manager www.rainwaterharvesting.co.uk/downloads/aquaprof.pdf

g) Trouble-Shooting the Pump

SYMPTOM	PROBABLE CAUSE	SOLUTION
Reduced water flow	A. Suction pipe, delivery pipe or check valve obstructed B. Suction of air	A. Remove obstructions B. Re-secure seals to ensure no air can pass. Pressure sensitive pumps are sensitive to air leaks in the pipes.
The pump motor does not run	A. No electric power or incorrect wiring B. Faulty condenser C. Pump has detected absence of water and has shut down. Pump might not have been properly primed. D. Magneto-thermic switch tripped E. Leak in the water piping on the delivery side of the pump, overheating of the water inside the pump, and tripping of the motor's thermal protection switch. F. Infiltration of water into the submerged electric connections has tripped the RCD G. Electronic board broken H. Pressure switch is faulty	A. Check the pump is connected to the power supply and rectify B. Replace the condenser ** C. Reset the level of water in the tank, re-prime the pump, wait for reset and try again. Priming means removing the small cap and pouring water into the body of the pump until full, and replacing the cap. D. Reset the switch or wait for auto-reset, depending on model (see manual) E. Check all joints and eliminate all leaks. Wait for the pump to cool down and reconnect to power. F. Contact technical support if pump continually trips its RCD protection. Likely pump replacement necessary. G. Replace the board ** or the pump H. Replace pressure switch ** or pump
The motor runs but no water is supplied	A. Suction filter clogged B. Air inside the pump or filter body C. Pump not primed D. No water in storage tank	A. Clean the filter B. and C. Prime the pump (remove from tank, remove small cap and pour water into the body of the pump until full), check water level in tank and that pump inlet is below this level and try again. D. Pump should have shut down; possible faulty flow sensor.
The pump does not stop after it has been disconnected from the water supply	A. Dirty or clogged filter B. Leak in pipes (pressure sensitive shut-off requires there to be no leak in the output pipe) C. Non-return valve jammed open D. Flow sensor broken	A. Remove obstructions B. Eliminate leak C. Replace non-return valve ** or the pump D. Replace flow sensor ** of the pump
The pump hunts, i.e. stops and starts intermittently	A. Small leak in pipe B. Non-return valve blocked C. Flow sensor stuck	A. Eliminate leaks B. Remove obstructions C. Unblock flow sensor through water outlet
The pump does not restart after the supply is re-opened	A. Pump has shut down due to lack of water. B. Pump has shut down due to tripping of the motor protection device C. Water head too high for the pump D. Broken pressure gauge.	A. Reset the level of water in the tank, re-prime the pump, wait for reset and try again. B. Check if delivery pipe is clogged, wait for the pump to cool down or reset and try again. C. Reduce the height the pump needs to get to D. Contact product support

** qualified personnel or return to factory required

Background: "pressure-sensitive" pumps switch off when no water flow is detected by the flow sensor (usually a Hall effect switch). They switch on when a drop in pressure is detected. The pressure sensitive switch does not provide both the on and off functions.

Before contacting product support at your retailer please run the following tests and prepare the following information:

1) Confirm what type of pump you have or note its colour and features, for example "a dark red Enviro pump with cartridge filter and floating intake".

2) Confirm that the pump had been primed before first use (black screw cap removed and about 5 litres of water poured in with a funnel)

3) Ensure that the water in the storage tank is clean and that the cartridge filter on the input (small end) side of the pump is clean and water flowing.

4) Ensure that the floating inlet is not blocked and the non return valve under the balls' mesh filter is working (suck from pump end and air should pass).

5) If there is a garden tap, turn the pump switch **on** and the tap on. Check whether the tap flows readily and without hesitation. Leave the tap open with a hosepipe to a safe part of the garden… for **15 minutes**. Note if the pump stops, if so, after how many minutes. If there is no garden tap do the same test by disconnecting the L joint from the pump in the turret of the tank (be careful not to let washers fall into the water).

6) With the top of the underground tank open, turn **off** the tap. Count the seconds till the pump turns off; it should be between **10 and 20 seconds**.

> Note that the Enviro, Series 3 and similar pumps have two electronic protection devices.
> a) Pressure sensitive switch: when back pressure builds the pump turns off
> b) Dry run protection switch: if the input valve senses no water, or very low water pressure then it turns itself off. This second switch (b) is the one that resets by turning the mains on and off. Therefore…

7) Check for any other reason why supply of water to the pump is restricted. Is the bottom of the tank very dirty? Could dirt be getting into the pump?

h) Maintenance

The Optimax Pro filter is maintenance-free if the soakaway or drain has been properly constructed. **After the first autumn**, **and annually,** lift the manhole cover and lift the lid off the Optimax filter to check that leaves are not accumulating there. If so, investigate the cause. Normally the flow of water pushes leaves and debris off the filter to drain. Read the note on soakaways above and ensure that any **leaf trap is cleared at least annually.**

If the pump is fitted with a cartridge filter, check it visually (if transparent) once a year and **replace the cartridge every five years.** Otherwise, the pump has no user serviceable parts and needs no other maintenance.

The Graf instruction manual for the Carat tanks (into which the Optimax Pro filter fits as standard) says "The entire system should be checked for leaks, cleanliness and stability every three months". Checking for leaks in something which is 2 metres below ground is difficult. But keep an eye round the top of the tank for water-logged ground in the rare case that you have a pipe or tank leak. Checking for stability is similar; you will notice pretty quickly if the tank moves or if there is earth movement or subsidence round the tank. If so, then you should get a groundworks contractor to find out the reason and re-establish a good surround of concrete, shingle or top soil round the tank. The frequency of checking for cleanliness is up to the user. Certainly it is important in the months after installation to make sure the filter and pump are working well; you can see this by the colour of the water in your toilets

The tank is maintenance-free unless silt builds up. As in an underground rock pool or stream, any vegetable and other debris sinks to the bottom as fine silt and should not enter the pumped supply. Silt can enter the pumped supply under 2 conditions: 1) The floating inlet sinks into the silt layer when the tank is nearly empty, soon after installation. Solution: ensure the float switch of the pump is adjusted so that the pump gets turned off as water level drops before the floating inlet touches the silt layer. 2) The silt layer has built up so much over time that the floating inlet now sucks up silt. Solution, **typically every 5 to 10 years**: clear out the silt by lowering a dirty pump to the bottom of the tank and pumping it out.

Enquire about a maintenance or service contract from RainWater Harvesting Limited.

RainWaterHarvesting.co.uk provides this information as a service to its clients and is given in good faith, to the best of our abilities and those of the manufacturers. No liability can be assumed for any consequence of fitting this system whether conform with the instructions or not.

For further information email info@rainwaterharvesting.co.uk mentioning "URGENT: installation advice" or phone us in office hours on 01733 405111 or 0800 074 7234

Contents:

RWH Ltd:	carat_tank_instructions_optimax_mains_backup.doc	9 pages
Otto Graf GbmH:	Carat_ANNEX_installation_Graf2011.pdf	9 pages
Otto Graf GbmH:	Carat_ANNEX_optimax_pro_2.pdf	8 pages

info@graf.info
www.graf.info

Installation and maintenance instructions for GRAF rainwater storage tank, Carat -S- series

2700 L 700 US-gallons	**Order No. 372024**
3750 L 1000 US-gallons	**Order No. 372025**
4800 L 1250 US-gallons	**Order No. 372026**
6500 L 1700 US-gallons	**Order No. 372027**

The points described in these instructions must be observed under all circumstances. All warranty rights are invalidated in the event of non-observance. Separate installation instructions are enclosed in the transportation packaging for all additional articles purchased from GRAF.

Missing instructions must be requested from us immediately.

The tank must be checked for any damage prior to insertion into the trench under all circumstances.

Installation must be carried out by a specialist company.

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1. General notes

1.1 Safety

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

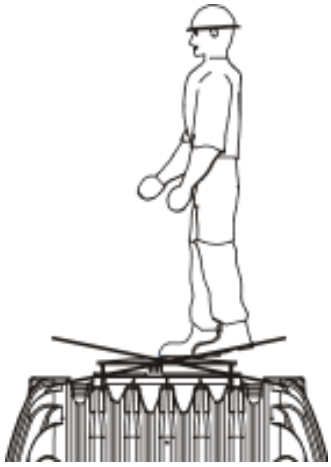
The relevant regulations and standards must additionally be taken into consideration during installation, assembly, servicing, repair, etc.

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

During all work on the system or parts of the system, the entire system must always be rendered inoperable and secured to prevent unauthorised reactivation.

Except in the event of work carried out in the tank, the cover of the tank must always be kept sealed, as this otherwise constitutes a maximum risk of accident. Only original GRAF covers or covers approved in writing by GRAF must be used.

GRAF offers an extensive range of accessories, all of which are designed to match each other and which can be extended to form complete systems. The use of other accessories may lead to impediments to the system's functional capability, therefore invalidating liability for resulting damage.



1.2 Identification obligation

All service water pipes and outlets must be identified in writing with the words **"Not drinking water"** or in the form of images in order to avoid inadvertent connection with the drinking water mains even after a number of years. Mix-ups, e.g. by children, may still occur even in the case of correct identification. All service water extraction points must therefore be installed with valves with **child-proof locks**.

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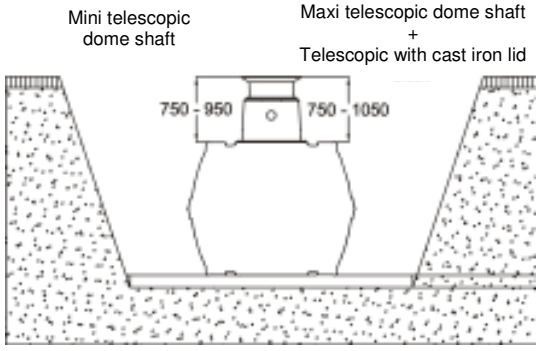
2. Installation conditions

Coverage heights with telescopic dome shaft in green areas.

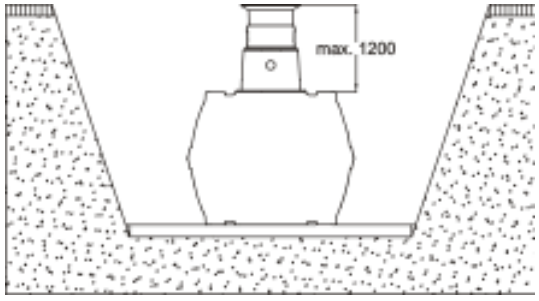
The mini dome shaft produces a depth of cover of between 750 and 950 mm.



Maximum coverage heights with intermediate section and telescopic dome shaft.

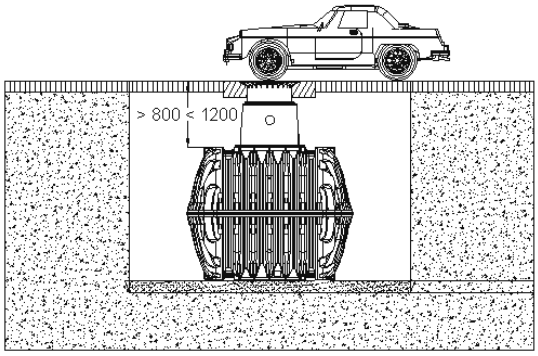
(in green areas only, without groundwater and stratum water)

Please do not install a system with more than 1200 mm total between top of the tank and the ground level because the weight of the soil would be too heavy for

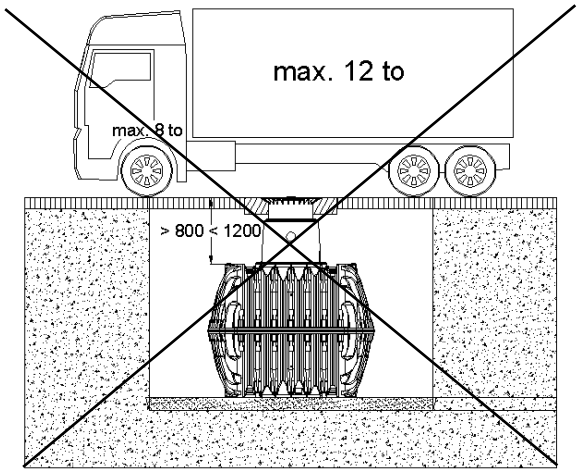


Coverage heights with cast telescopic dome shaft (class B) in areas used by passenger cars.

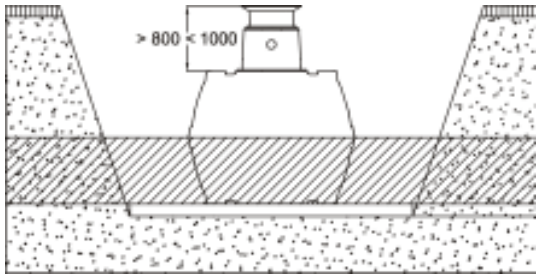
(without groundwater and stratum water)



The Carat – S series tanks must not be installed below areas used by vehicles which are heavier than passenger cars.



The Carat – S series tanks must not be installed below areas used by vehicles which are heavier than passenger cars.



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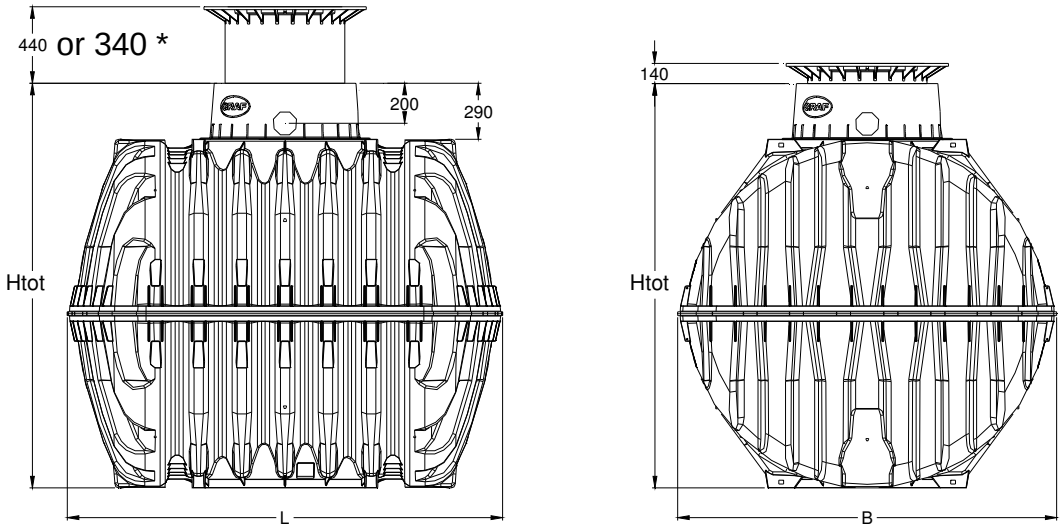
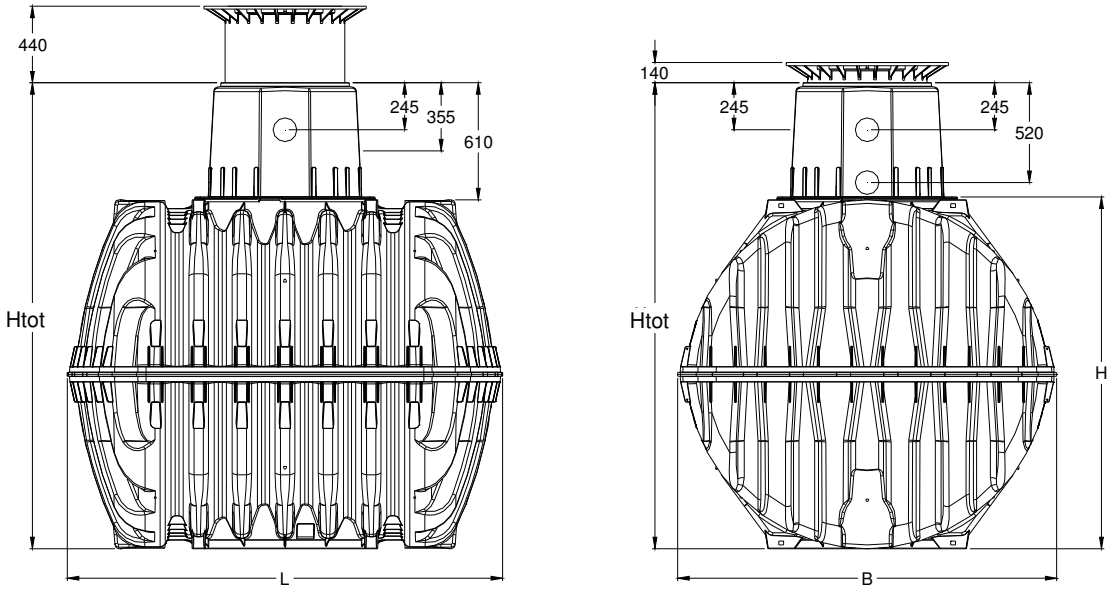
3. Technical data



* Maxi-lid 440 mm high but tank usually supplied with mini-lid at 340 mm high

with tank dome Mini



with tank dome Maxi

Tank	**2700 litres** **700 US-gallons**	**3750 litres** **1000 US-gallons**	**4800 litres** **1250 US-gallons**	**6500 litres** **1700 US-gallons**
Art. No.	370001	370002	370003	370004
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
Htot*	2010 mm	2200 mm	2430 mm	2710 mm
Htot** with mini tank dome	1680 mm	1870 mm	2100 mm	2380 mm

* Htot = total height

4. Tank structure

① Cover

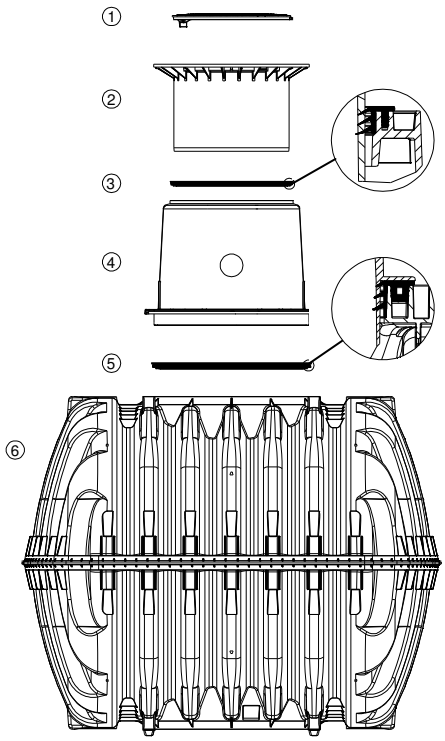
② Telescopic dome shaft (can be inclined by 5°)

③ Profile seal

④ Tank dome (can be rotated by 360°)

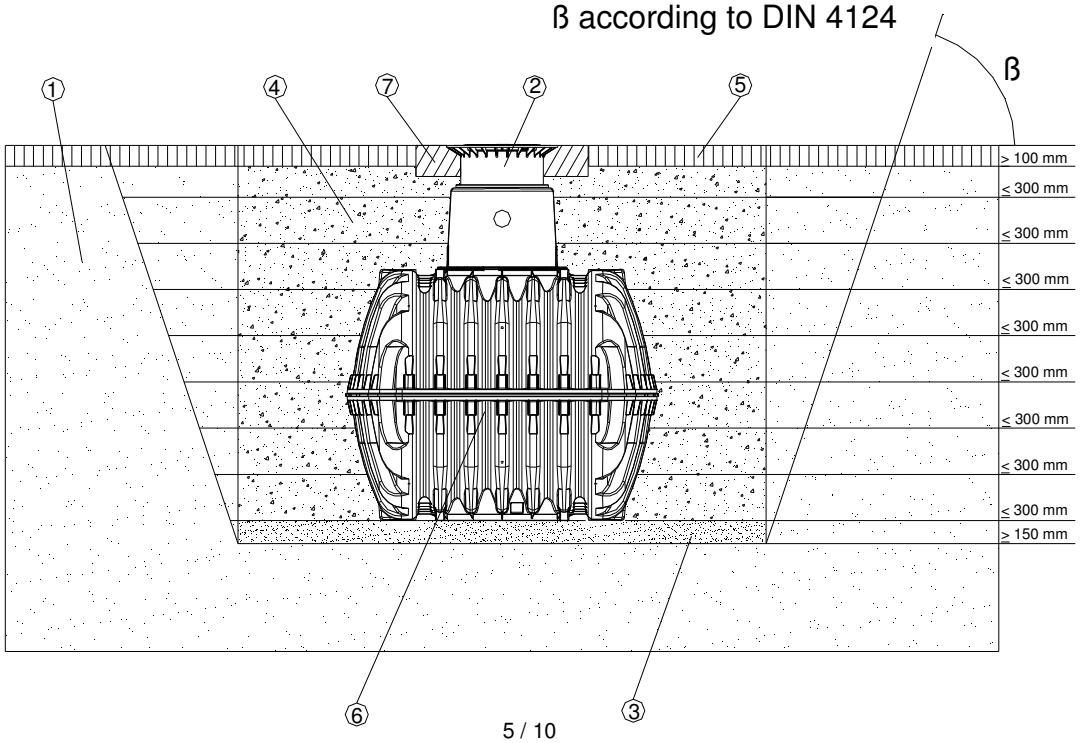
⑤ Tank - tank dome seal

⑥ Carat underground tank



5. Installation and assembly

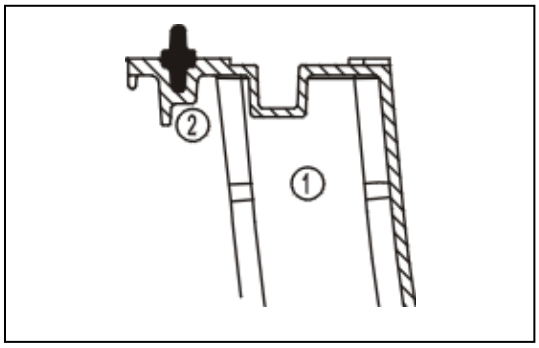
① Subsoil
② Telescopic dome shaft
③ Compacted foundation
④ Surrounding (round-grained gravel, max. grain size 8/16)
⑤ Covering layer
⑥ Carat underground tank
⑦ Concrete layer for surfaces used by passenger cars



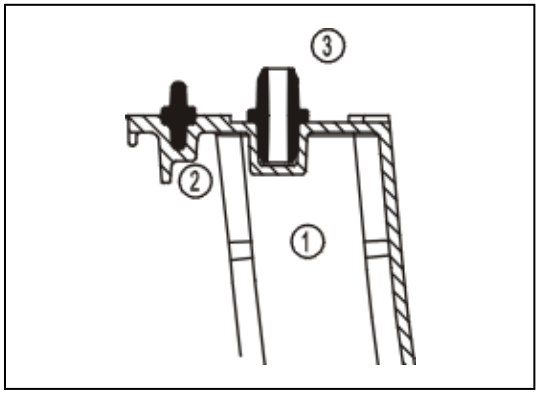
5. Installation and assembly

5.1 Tank assembly

First insert the circumferential profile seal ② into the sealing groove in the lower half shell ①. Lightly coat the seal with the enclosed soft soap.

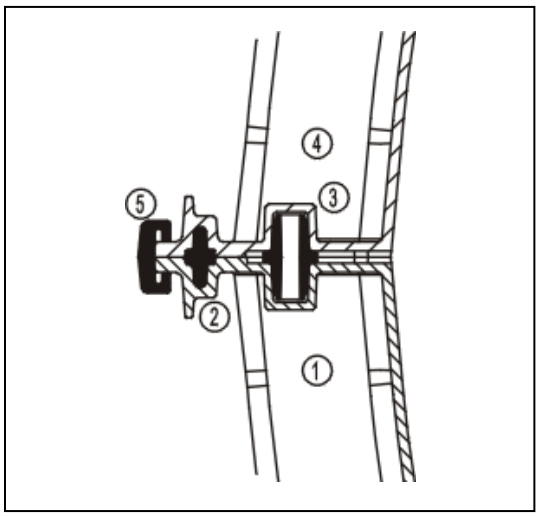


Then insert the centring pins ③ into the intended mountings around the circumference.



The upper half shell ④ is now positioned onto the lower half shell ① and the quick connectors ⑤ are installed. To do this, each 2nd quick connector is pre-adjusted in the 1st step and is secured with a hammer and a wooden support. The quick connectors engage in their end position. The remaining quick connectors are then installed.

Attention: When positioning the upper half shell, it must be ensured, under all circumstances, that the seal does not slip out of the groove.



5.2 Construction site

Under all circumstances, the following points must be clarified prior to installation:

- The structural suitability of the ground according to DIN 18196
- Maximum groundwater levels which occur and drainage capability of the subsoil
- Types of load which occur, e.g. traffic loads

An expert ground report should be requested from the local planning authority to determine the physical characteristics of the subsoil.

5. Installation and assembly

5.3 Trench

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

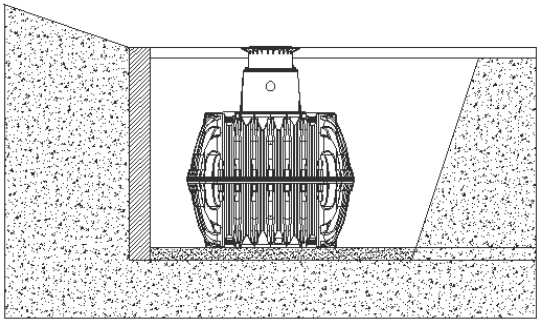
The trench embankment must be designed so that slippage or collapse of the embankment wall is not to be anticipated. The construction site must be horizontal and plane and must guarantee sufficient load-bearing capacity.

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

A layer of compacted, round-grain gravel (grain size 8/16, thickness approx. 150 - 200 mm) is applied as the foundation.

5.3.1 Slope, embankment, etc.

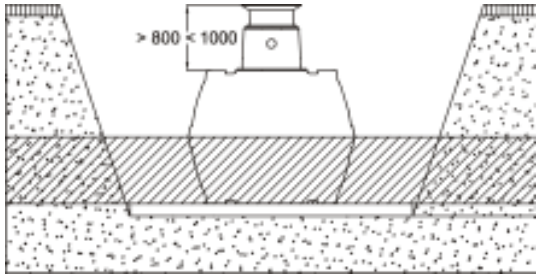
On installation of the tank in the immediate vicinity (< 5 m) of a slope, earthen mound or slope, a statically calculated supporting wall must be erected to absorb the soil pressure. The wall must exceed the dimensions of the tank by at least 500 mm in all directions, and must be located at least 1000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



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

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

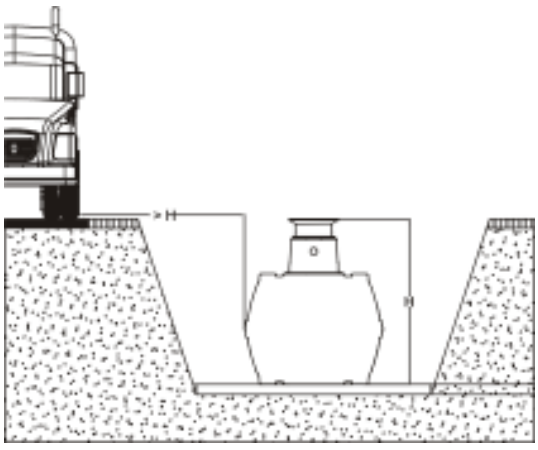
Dissipation of the drainage water (e.g. via an annular drainage system) is recommended in the case of cohesive, water-impermeable soils.



Tank size	2700 L 700 US-gallons	3750 L 1000 US-gallons	4800 L 1250 US-gallons	6500 L 1700 US-gallons
Immersion depth	700 mm	795 mm	910 mm	1050 mm

5.3.3 Installation adjacent to surfaces used by vehicles

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

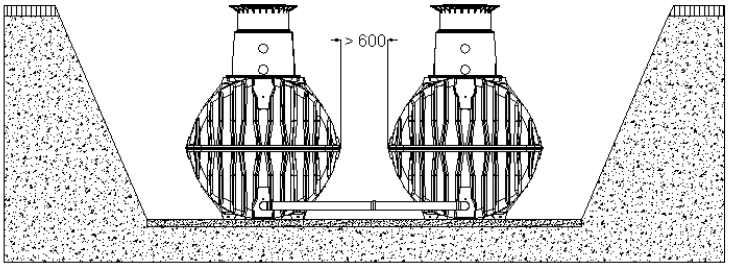


5. Installation and assembly

5.3.4 Connection of several tanks

Two or more tanks are connected via the assembly surfaces by means of GRAF special seals and basic pipes (to be provided at construction site).

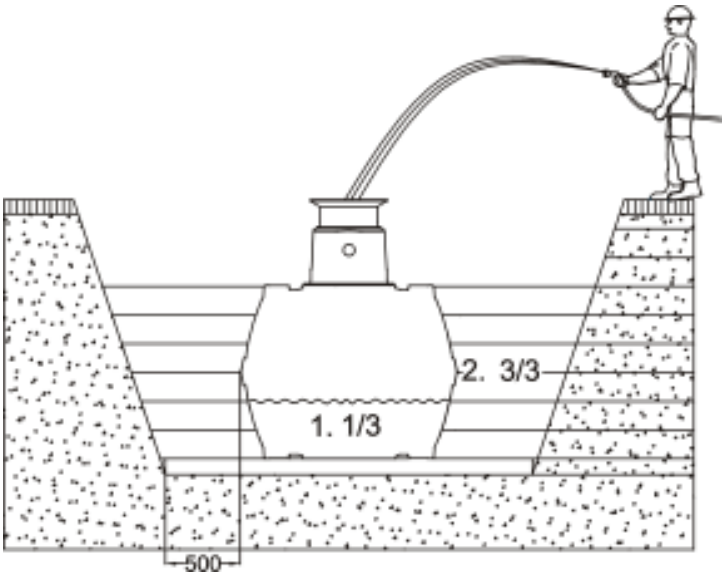
The apertures must be drilled to the corresponding size using only the GRAF special crown bit. It must be ensured that the distance between the tanks is at least 600 mm. The pipes must project at least 200 mm into the tanks.



5.4 Insertion and filling

The tanks must be inserted, impact-free, into the prepared trench using suitable equipment. To avoid deformities, the tank is filled 1/3 with water before filling in the tank surrounding.

Afterwards the surrounding (roundgrain gravel, max. grain size 8/16) is then filled in layers of max. 30 cm steps and is compacted. The individual layers must be well-compacted (manuel tamper). Damage to the tank must be avoided during compaction. Mechanical compaction machines must not be used under any circumstances. The surrounding must be at least 500 mm wide.

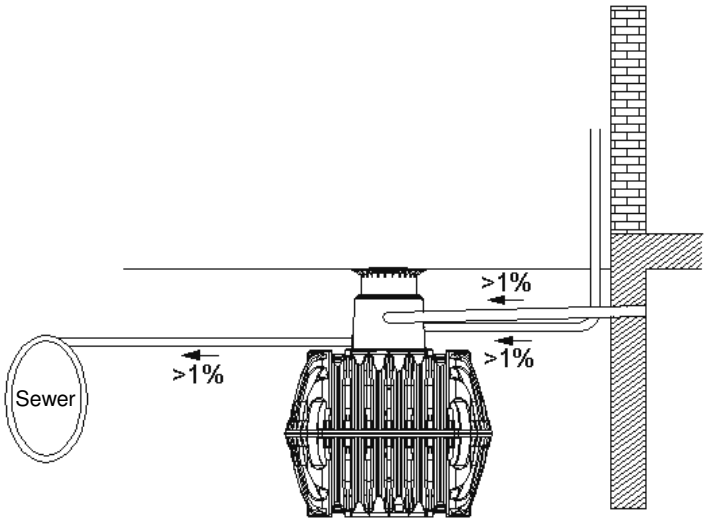


5.5 Routing connections

All feed and overflow pipes must be routed with a decline of at least 1% in the direction of flow (possible, subsequent settling must be taken into consideration in this case). If the tank overflow is connected to a public sewer, this must be protected against reflux by means of a lifting station (mixed sewer) or reflux seal (pure rainwater sewer) according to DIN 1986.

All suction, pressure and control lines must be routed in an empty pipe, which must be routed as straight as possible, without bending, to the tank with a decline. Necessary bends must be formed using 30° moulded sections.

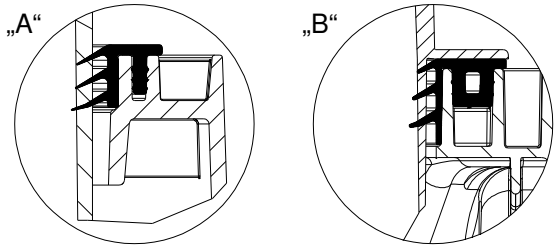
Important: The empty pipe must be connected to an aperture **above** the max. water level.

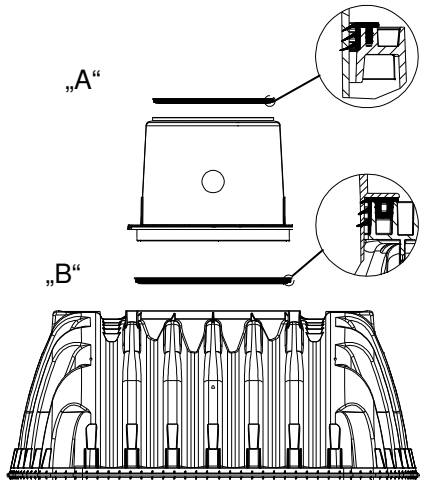


6. Assembling the tank dome and telescopic dome shaft

6.1 Assembling the tank dome

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 locked to the tank neck. It is essential to make sure that the upper seal "A" is correctly installed.

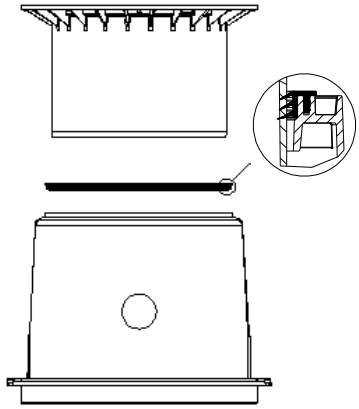




6.2 Assembling the telescopic dome shaft

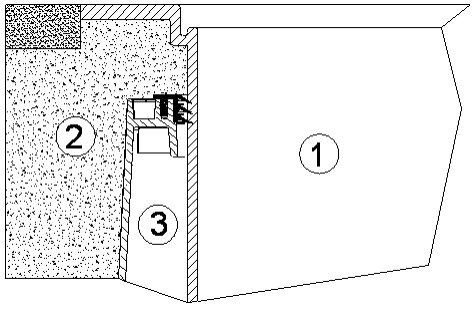
The telescopic dome shaft enables infinite adaptation of the tank to given site surfaces with earth coverage of between 750 mm and 950 mm (Mini telescopic dome shaft) or 750 mm and 1050 mm (Maxi telescopic dome shaft).

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



6.3 Telescopic dome shaft on which persons may walk

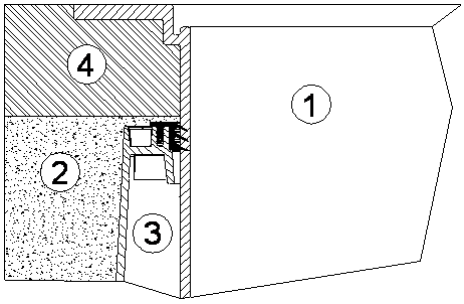
Important: To prevent loads from being transferred onto the tank, round-grain gravel ① (max. grain size 8/16) is filled in in layers around the telescope ② and is evenly compacted. Damage to the tank dome ③ and telescope must be avoided during this step. The cover is then positioned and is sealed to prevent entry by children. **Tighten the threaded connection on the cover so tightly that it cannot be opened by a child!**



6.4 Telescopic dome shaft over which passenger cars may drive

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

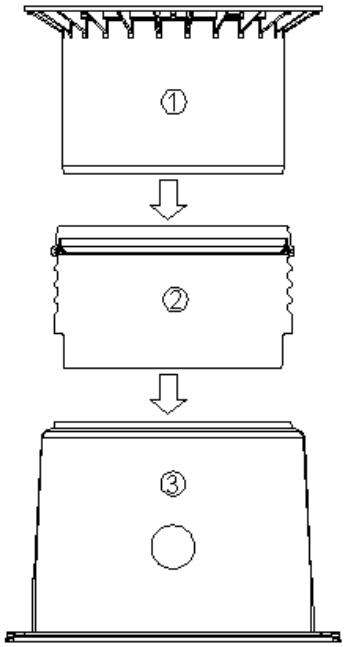
Attention: Use the cast cover under all circumstances.



6. Assembling the tank dome and telescopic dome shaft

6.5 Assembling the adapter

For lager coverage heights a adapter is needed. To insert the adapter into the tank dome, soft soap is needed. Into the highest groove of the adapter the profile seal is inserted an greased generously. Afterwards push the telescopic dome shaft into the adapter and adapt it to the planned area surface.



1 Adapter = max. earth-cover 1200 mm

(in each case in connection with the Maxi telescopic dome shaft)

① Telescopic dome shaft (can be inclined by 5°)

② Adapter

③ Tank dome (can be rotated by 360°)

7. Inspection and servicing

The entire system must be checked for leaks, cleanliness and stability at least every three months.

The entire system should be serviced at intervals of approx. 5 years. In this case, all parts of the system must be cleaned and their function checked. Servicing should be carried out as follows:

- Drain the tank completely
- Clean surfaces and internal parts with water
- Remove all dirt from the tank
- Check that all internal parts are firmly seated.

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Anleitung für Einbau und Wartung Optimax-Pro Filter Intern
Notice de montage et d'utilisation du filtre Optimax-Pro interne
Instruction for installation and maintenance Optimax-Pro Filter internal

Optimax-Pro Filter Intern
Art.-Nr.: 340037

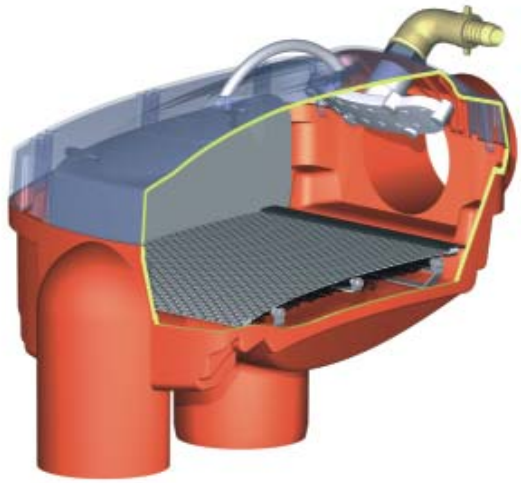
Filtre Optimax-Pro interne
Réf.: 340037

Optimax-Pro Filter internal
Item No.: 340037

Ausbaupaket 3
Art.-Nr. 342005

Pack accessoires n°3
Réf.: 342005

Filter package 3
Item No.: 342005



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GRAF SA - 45, route d'Ernolsheim, F- 67120 Dachstein-Gare – Tel.: 0033/388497310, Fax: 0033/388493280 – www.graf.fr, info@graf.fr

1. Allgemeine Hinweise / Généralités / General advices

Die in dieser Anleitung beschriebenen Punkte sind unbedingt zu beachten. Bei Nichtbeachtung erlischt jeglicher Garantieanspruch. Für alle Zusatzartikel erhalten Sie separate, in der Transportverpackung beiliegende, Einbauanleitungen.

Fehlende Anleitungen sind umgehend anzufordern.

Eine Überprüfung der Komponenten auf eventuelle Beschädigungen hat unbedingt vor der Montage bzw. Installation zu erfolgen.

Der Einbau ist fachmännisch durchzuführen.

Lisez attentivement les instructions données dans la notice. Tout manquement à ces consignes annulera la garantie. Lisez également les notices de tous les autres éléments fournis avec votre kit GRAF.

Les notices manquantes sont à récupérer auprès de nos services.

Avant tout montage il est indispensable de vérifier le contenu du carton. Tout article manquant ou non conforme est à signaler immédiatement et ne devra pas être installé.

L'installation doit être réalisé par un professionnel.

It is indispensable to follow the different instructions of this manual. In case of non-observance any warranty claim is suspended. For every accessory supplied by GRAF you will receive separate installation instructions which will be enclosed in the transport packaging.

Any missing instructions have to be requested immediately.

Previous to installation and mounting, it is obligatory to test all components for possible damages.

The installation has to be realised in a professional manner.

1. Allgemeine Hinweise / Généralités / General advices

1.1 Sicherheit

Bei sämtlichen Arbeiten sind die einschlägigen Unfallverhütungsvorschriften nach BGV C22 zu beachten. Besonders bei Begehung der Behälter ist eine 2. Person zur Absicherung erforderlich.

Des weiteren sind bei Einbau, Montage, Wartung, Reparatur usw. die in Frage kommenden Vorschriften und Normen zu berücksichtigen. Hinweise hierzu finden Sie in den dazugehörigen Abschnitten dieser Anleitung.

Die Installation der Anlage bzw. einzelner Anlagenteile muss fachmännisch und nach beiliegender Anleitung durchgeführt werden.

Bei sämtlichen Arbeiten an der Anlage bzw. Anlagenteilen ist immer die Gesamtanlage außer Betrieb zu setzen und gegen unbefugtes Wiedereinschalten zu sichern.

GRAF bietet ein umfangreiches Sortiment an Zubehörteilen, die alle aufeinander abgestimmt sind und zu kompletten Systemen ausgebaut werden können. Die Verwendung anderer Zubehörteile kann dazu führen, dass die Funktionsfähigkeit der Anlage beeinträchtigt und die Haftung für daraus entstandene Schäden aufgehoben wird.

1.1 Sécurité

Les règles de sécurité doivent impérativement être respectées lors de l'installation de la cuve et des accessoires. Durant l'inspection de l'installation, une deuxième personne doit être présente.

Les instructions d'installation, de montage, d'entretien et de réparation indiquées ci-après doivent être scrupuleusement respectées.

L'installation des accessoires doit être effectuée par un installateur professionnel. Durant toute intervention sur les accessoires, l'installation complète doit être mise hors service.

Lors de toute intervention sur l'installation (montage, vérification, réparations éventuelles…), les précautions d'usage et normes en vigueur sont à respecter.

Durant toute intervention sur la cuve ou les accessoires, l'installation complète doit être mise hors service.

La société Graf vous propose une gamme d'accessoires complémentaire et décline toute responsabilité en cas d'utilisation d'article non compatible pouvant nuire au bon fonctionnement de votre installation.

1.1 Safety

For all workings it is indispensable to observe the relevant domestic rules for accident prevention. Especially when walking over the container a 2nd person is necessary for safeguard.

Furthermore all relevant rules and norms have to be observed during installation, assembly, maintenance and repairing. Please find relating advices in the respective chapters of this instruction manual.

The installation of this rainwater harvesting system respectively its different components has to be realized in a professional manner and according to the enclosed instruction manual.

For all workings on the system and its components respectively the whole system has to be stopped and protected against unauthorized resetting.

GRAF offers a wide range of accessories which are all matched to each other and which can be extended to complete systems. The use of other accessories may lead to dysfunctions and the suspension of the liability for resulting damages.

1. Allgemeine Hinweise / Généralités / General advices

1.2 Kennzeichnungspflicht

Das Betriebswasser ist nicht zum Verzehr und zur Körperhygiene geeignet.

Alle Leitungen und Entnahmestellen von Brauchwasser sind mit den Worten **„Kein Trinkwasser“** schriftlich oder bildlich zu kennzeichnen (DIN 1988 Teil 2, Abs. 3.3.2.) um auch nach Jahren eine irrtümliche Verbindung mit dem Trinkwassernetz zu vermeiden. Auch bei korrekter Kennzeichnung kann es noch zu Verwechslungen kommen, z.B. durch Kinder. Deshalb müssen alle Brauchwasser – Zapfstellen mit Ventilen mit **Kindersicherung** installiert werden.

1.2 Marquage

L’eau de pluie simplement filtrée (c’est à dire non traitée) ne doit en aucun cas être utilisée pour une consommation courante ou l’hygiène corporelle.

Afin d’éviter toute confusion, toutes les sorties d’eau de pluie doivent être signalées par la mention écrite ou en image « **Eau non potable** ». Les tuyauteries doivent être marquées d’un adhésif de couleur pour être repérées facilement. Toutes les sorties doivent être équipées de vannes « **sécurité enfant** ».

1.2 Marking responsibility

The process water is not suitable for consumption and for body hygiene.

All conduits and tappings of process water have to be marked with **„no drinking water**“ in writing or by illustrations according to the relevant domestic rules, in order to avoid the wrong connection with the drinking water pipework even after years of use. Wrong use may even arise with correct marking, e.g. by children. Therefore all process water tappings have to be installed with **child-safe** valves.

2. Einbaubedingungen / Conditions d’installation / Installation conditions

2.1 Optimax-Pro Filter Intern:

- Der Optimax-Pro Filter Intern ist geeignet für den Einbau in einen Vorschacht oder eine Zisterne
- Der Höhenunterschied zwischen Zulauf und Ablauf beträgt 165 mm
- Der Filter ist geeignet für Dachflächen bis 350 m².
- Die Maschenweite des Siebeinsatzes beträgt 0,35 mm.

2.1 Filtre Optimax-Pro interne:

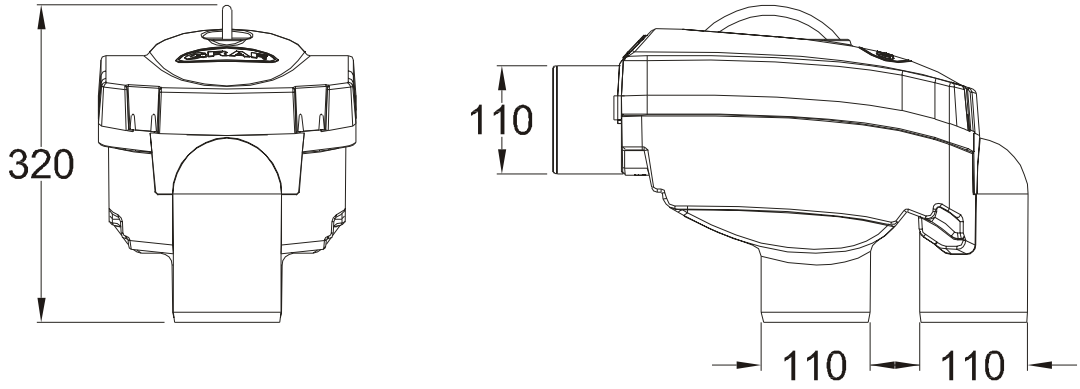
- Le filtre Optimax-Pro est prévu pour être installé dans une cuve ou un regard de visite.
- Le dénivelé entre l’entrée et la sortie du filtre est de 165 mm.
- Le filtre est adapté aux toitures jusqu’à 350 m^2.
- La maille du filtre est de 0,35 mm.

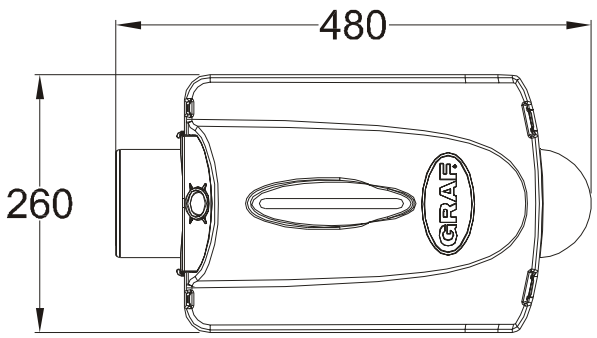
2.1 Optimax-Pro Filter internal

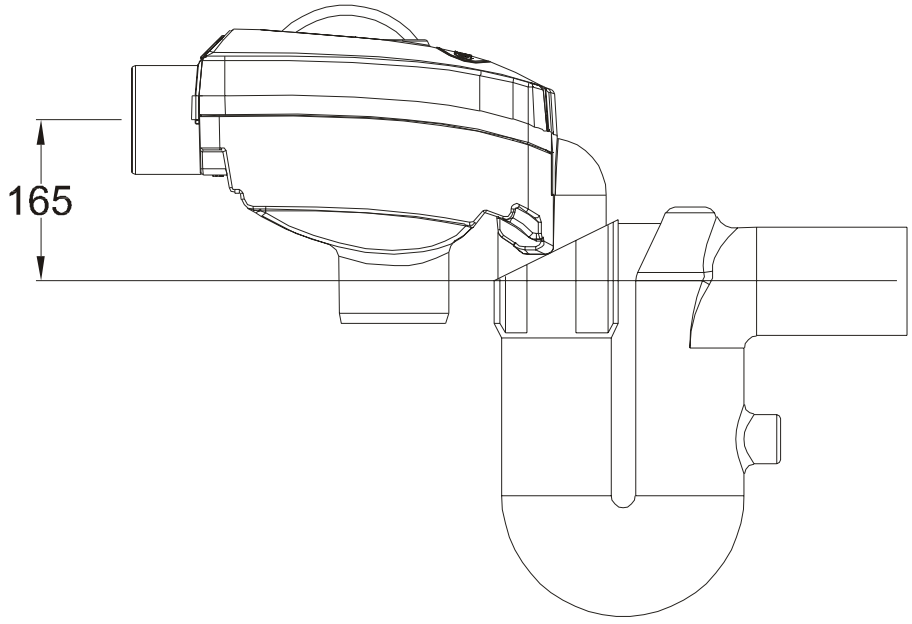
- The Optimax-Pro Filter is suitable for installation in a manhole or a underground tank.
- The difference of level between inflow and outflow is 165 mm.
- The filter is suitable for roof areas up to 350 m².
- The mesh width of the sieve insert is 0.35 mm.

3. Technische Daten / Spécifications techniques / Technical specifications

Abmessungen / Dimensions / Dimensions:







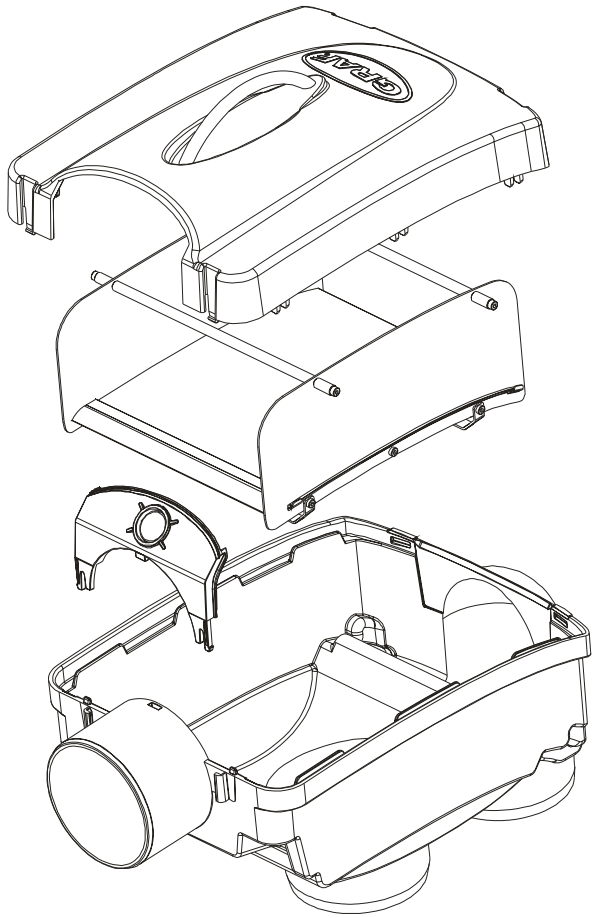
4. Aufbau / Assemblage / Assembly

① Transparenter Deckel
Couvercle transparent
Clear transparent cover

② Siebeinsatz aus Edelstahl
Grille filtrante en acier
Filter inset
Sieve insert in stainless steel

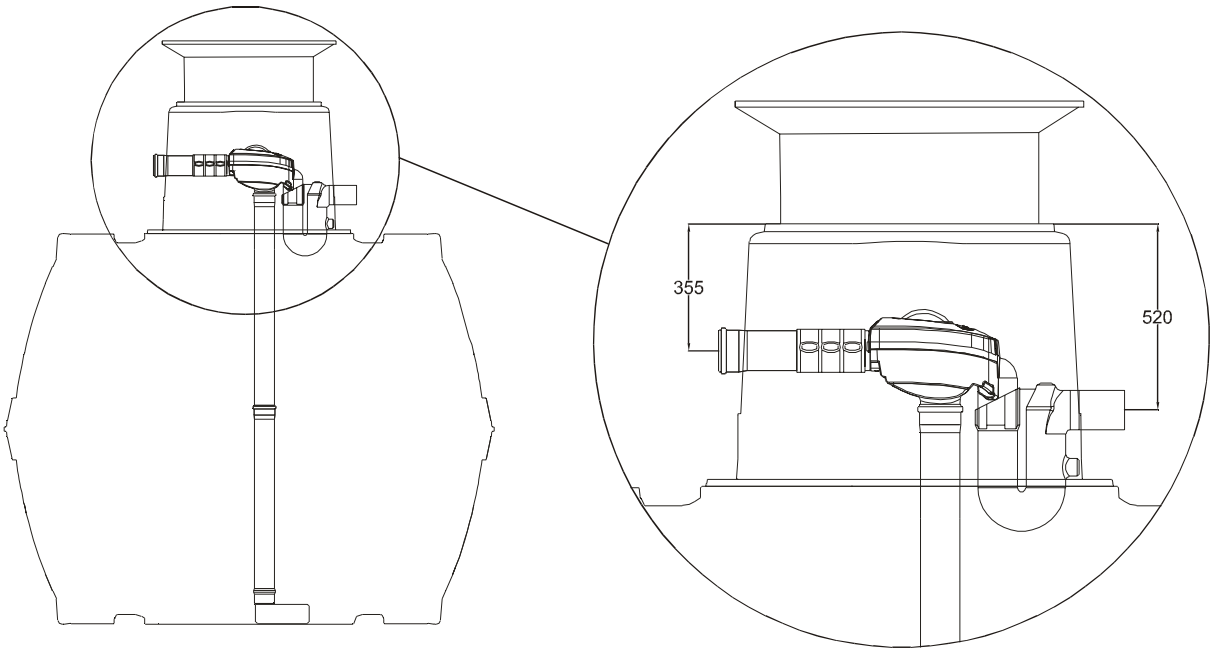
③ Halter für Opticlean
Support pour Opticlean
Support for Opticlean

④ Filtergehäuse
Corps du filtre
Filter body



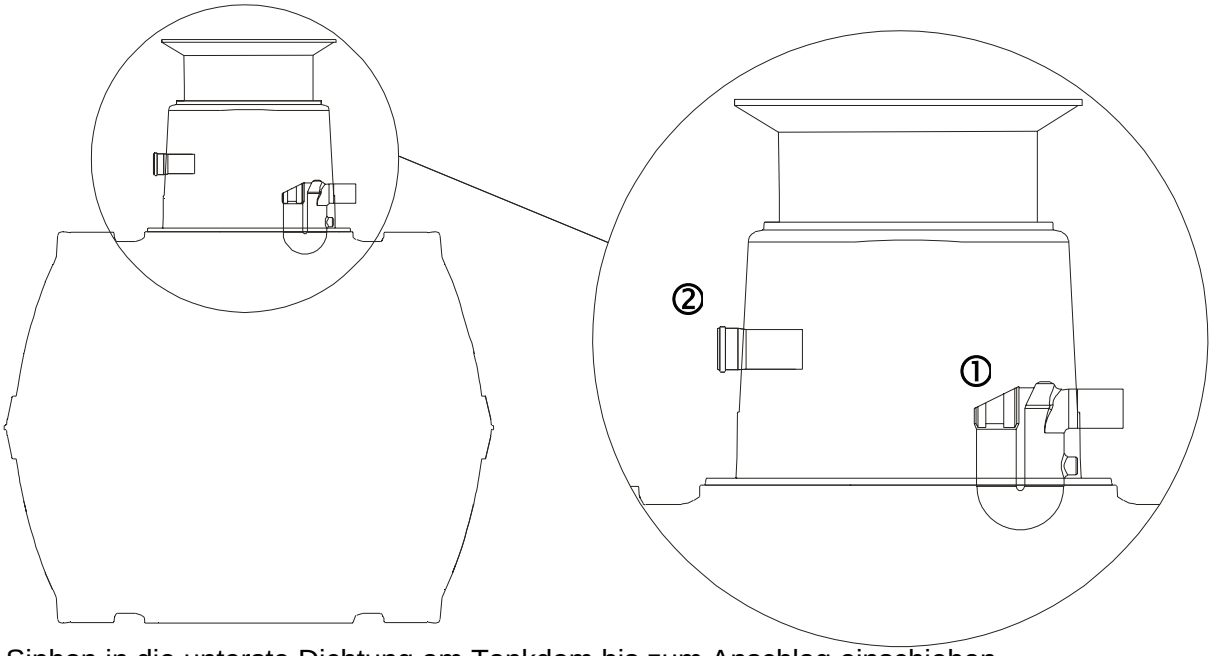
5. Einbau / Montage / Installation

5.1 Übersicht / Aperçu du filtre / Overview



5. Einbau / Montage / Installation

5.2 Montage Zulaufrohr und Siphon / Connexion de l'arrivée et du siphon / Installation of inflow pipe and overflow siphon



① Siphon in die unterste Dichtung am Tankdom bis zum Anschlag einschieben
② Zulaufrohr (Carat = Länge 150 mm, Diamant = Länge 250 mm) von außen gegenüberliegend einschieben

① Insérez le siphon dans le joint inférieur jusqu' à la butée
② Tuyau d'arrivée (Carat = Longueur 150 mm, Diamant = Longueur 250 mm) à introduire de l'extérieur

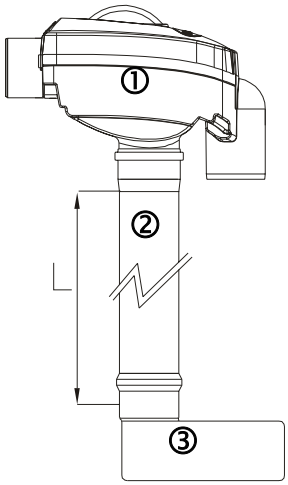
① Insert the overflow siphon in the lower seal till block.
② Insert the inflow pipe (Carat = length 150 mm, Diamant = length 250 mm) from outside

5.3 Filter zum Einsetzen vorbereiten / Préparation de la pose du filtre / Preparation filter for installation

Das Filtergehäuse ① mit einem bauseits zu stellenden KG/HT Rohr DN 100 ② mit dem beruhigten Einlauftopf ③ (im Ausbaupaket 3 enthalten) verbinden. Alle Verbindungsstellen mit handelsüblichen Spaxschrauben gegen auseinander rutschen sichern.

Raccorder le corps de filtre ① au tuyau anti-remous PCV DN 100 ② fourni et compris dans le pack accessoire n°3.
Le sabot anti-remous ③ est à raccorder et à utiliser uniquement pour les cuves de capacités de 7800 L et 9200 L.
Les connexions sont à bloquer à l'aide de vis (types vis à bois) pour éviter que l'ensemble glisse.

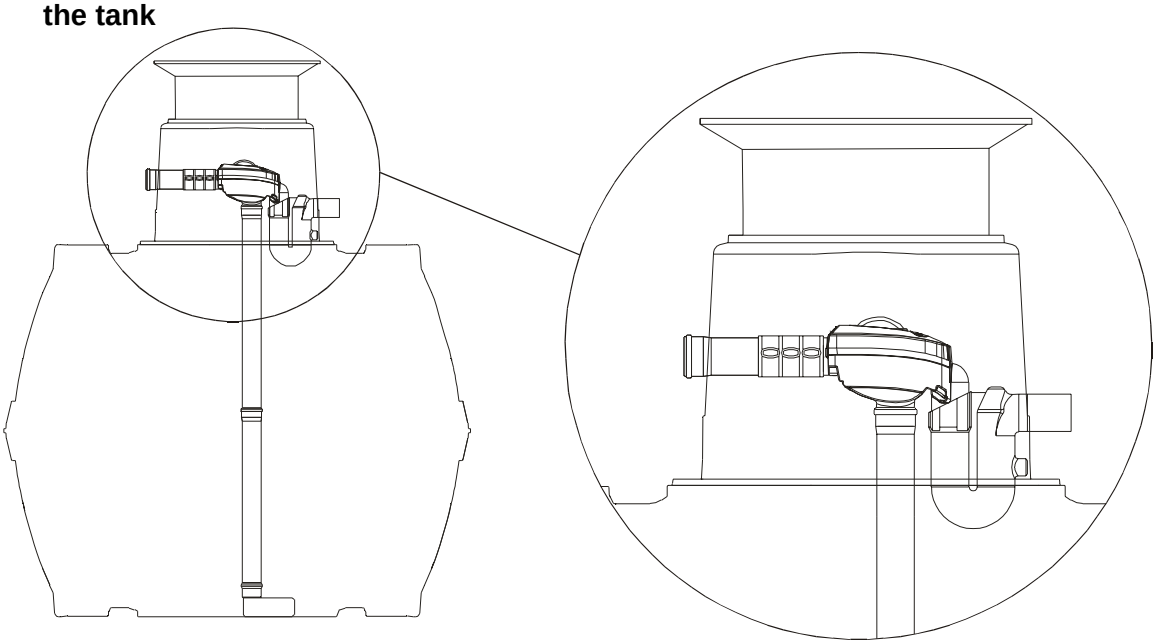
Connect the filter body ① with a PVC pipe DN 100 ② (on site) with the inlet stilling pot ③ (contained in filter package 3).
Fix all junctions with screws (against shift of pipes).



Carat	2700 L	3750 L	4800 L	6500 L	7500 L	9800 L	13000 L
[L]	1330 mm	1550 mm	1800 mm	2050 mm	1550 mm	1800 mm	2050 mm
Diamant	2200 L	3350 L	4800 L	6500 L	7800 L	9200 L	
[L]	950 mm	1150 mm	1400 mm	1650 mm	1800 mm	2000 mm	

5. Einbau / Montage / Installation

5.4 Filter in den Tank einsetzen / Pose du filtre dans la cuve / Insert the filter into the tank



Den mit dem beruhigten Einlauf und Einlauftopf vorbereiteten Filter in den Tank einsetzen. Dabei den Überlauf des Filters von oben in den Siphon schieben und das Zulaufrohr mit dem Filterzulauf mittels Spannfixmanschette (im Ausbaupaket 3 enthalten) verbinden.

Placez le filtre avec le tuyau PVC et l'anti remous dans la cuve. Posez le trop-plein du filtre sur le siphon et branchez l'arrivée d'eau de pluie au filtre à l'aide de la manchette de fixation (contenue dans le pack accessoires n° 3).

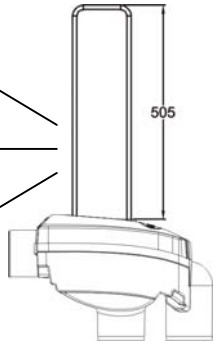
Insert the filter, prepared with the flow calming downpipe and the inlet stilling pot, in the tank. Telescope the overflow from top into the siphon and fix the filter inflow with the spannfix collar (contained in filter package 3).

6. Zubehör / Accessoire / Accessory

Griff XL für
Optimax – Pro Filter
Art.-Nr. 330220

Bras XL pour
filtre Optimax-Pro
Réf.: 330220

Handle XL for
Optimax – Pro Filter
Item-No. 330220



7. Wartung / Maintenance / Maintenance

Je nach Schmutzanfall im Dachablaufwasser muss die Siebfläche des Optimax-Pro Filters mehrmals im Jahr gereinigt werden. Beim Abnehmen des transparenten Deckels bleibt der Siebeinsatz an diesem hängen und kann somit problemlos entnommen und gereinigt werden.

Nettoyer plusieurs fois par an le filtre Optimax-Pro pour enlever les saletés provenant des toitures. La grille filtrante est fixée au couvercle transparent, ce qui permet une prise aisée pour le nettoyage.

Depending on the dirtiness of the roof surface water the sieve has to be cleaned several times a year. Remove the transparent cover from the filter body. The sieve and the cover is one unit. Removing and cleaning is unproblematic.