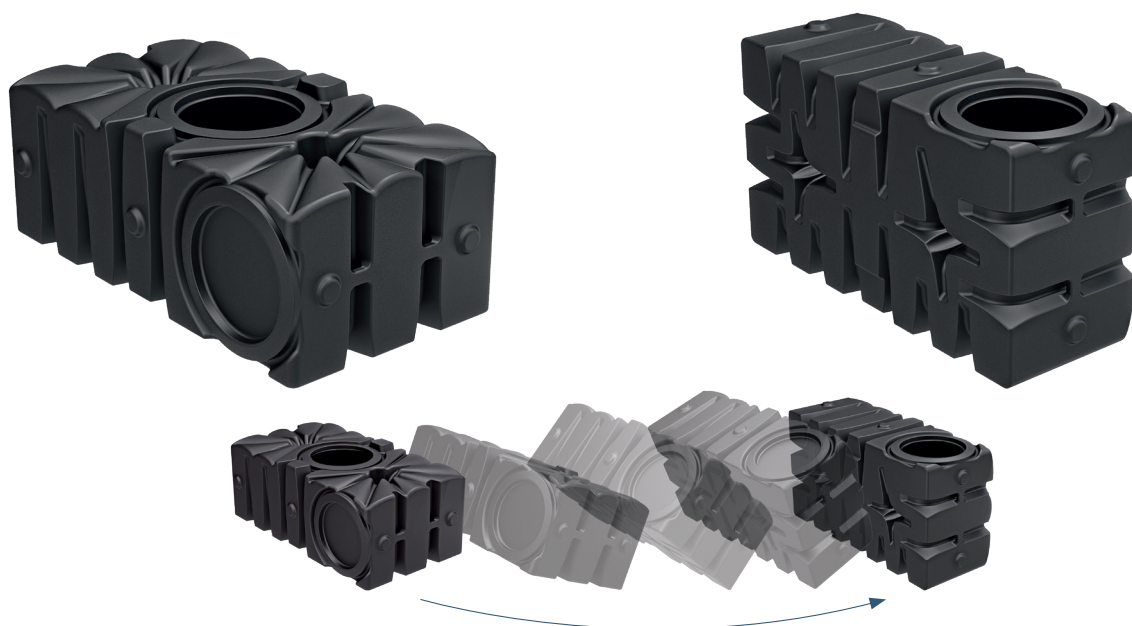


# ACO Rain4me rainwater flat tank

## Installation and operation manual



**!** We provide a 25 year guarantee on the integrity (no deformation, no leakage) of the respective underground tanks.

### Warranty conditions:

- Installation in full compliance with our installation and operating instructions.
- Proper utilisation and handling.

In the event of a warranty claim, we will replace and supply the materials used free of charge. Any warranty services above and beyond are excluded. The above does not apply to any defect liability claims.

### We recommend installation by skilled personnel.

You will receive separate installation instructions for all additional articles purchased from ACO. These instructions must be observed without fail!

Missing instructions must be requested from us immediately; alternatively you can download them from **[www.rain4me.aco](http://www.rain4me.aco)**.

## 1 General information

### 1.1. Safety

The relevant accident prevention regulations according to BGV C22 must be observed during all work. These can be viewed on the website of the German Social Accident Insurance Institution for the building trade (<http://www.bgbau-medien.de>); with regard to earthenworks, tank installation and excavation pits, DIN 18300, DIN 4124, DIN EN 1610 and the worksheets DWA-A 139 and ATV-DVWK-A 127 must be observed.

Access to the tank without appropriate ground cover is not intended and should be avoided; if it is absolutely necessary due to the installation conditions, special safeguards must be provided by a second person (danger of slipping or similar).

Furthermore, the relevant regulations and standards must be observed during installation, assembly, maintenance, repair, etc. Please refer to the relevant sections of this manual. Whenever work is carried

out on the system or parts of the system, the entire system must always be taken out of operation (if electrical installations are fitted) and secured against accidental reconnection.

The tank cover must always be kept closed, except when working inside the tank, otherwise there is a high risk of accidents.

Any transport packaging for openings can not be walked on nor are they childproof and must be replaced with suitable covers or pipe connections immediately after delivery.

ACO offers a wide range of accessories, which are all coordinated and can be expanded to complete systems. The list of optional accessories can be found online at [www.rain4me.aco](http://www.rain4me.aco).

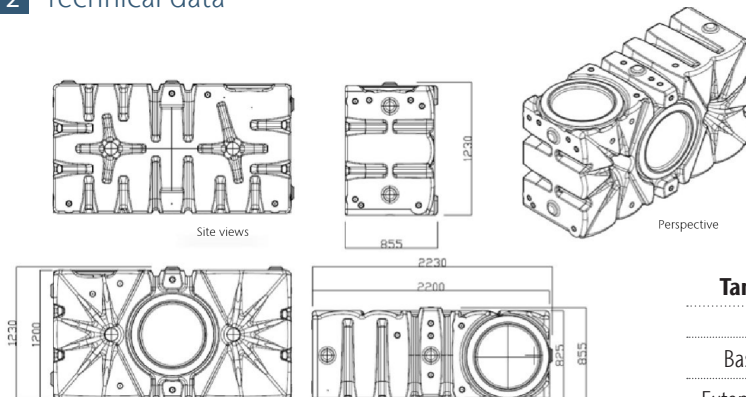
The use of other accessories can lead to the functionality of the system being impaired and the liability for any resulting damage being waived.

## 1.2 Labelling obligation

All pipes and tapping points for service water must be labelled by the user with the words „not drinking water“ in writing or using pictures (DIN 1988 Part 2, Para. 3.3.2) in order to avoid erroneous connection to the drinking water network even after many years (the labelling material, unless it is enclosed with the delivery or is additionally required, can be found in the list of accessories at the end of this description). Even with correct labelling, mistakes can still occur, e.g. by children. For this reason, child-proof valves must be installed at all service water taps.

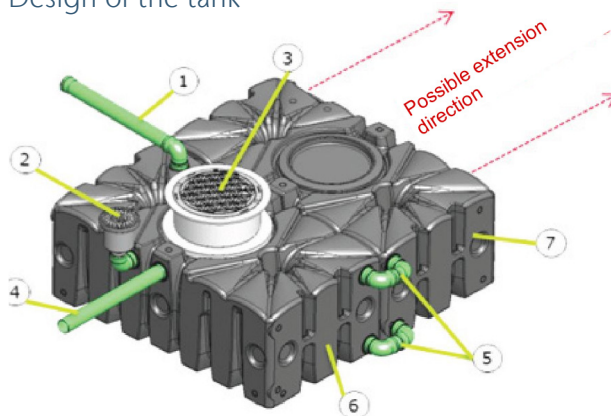


## 2 Technical data



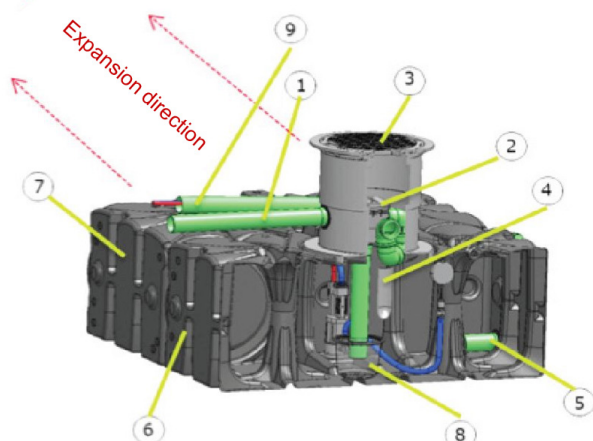
Tank	Weight	Length	Width	Height	Material	Art. no.
	[kg]	[mm]	[mm]	[mm]		
Base	Approx. 105	2230	1230	855	PE-LLD	103000
Extension	Approx. 105	2230	1230	855	PE-LLD	103002

## 3 Design of the tank



### Version: flat parallel (e.g. Basic garden version)

- 1 Roof inlet
- 2 water intake point
- 3 Dome
- 4 Overflow
- 5 Tank connection (min. 20 cm into the tank)
- 6 Base tank
- 7 possible expansion tank



### Version: flat parallel (e.g. House & Garden Compact version)

- 1 Roof inlet
- 2 Built-in tank filter
- 3 High dome
- 4 Overflow
- 5 Tank connection (min. 20 cm into the tank)
- 6 Base tank
- 7 Expansion tank
- 8 Inlet calming
- 9 Reserve conduit with water and electricity supply to the house



## 5.2. Excavated pit

Load-bearing soil is required as a substrate! The compaction for the substructure is based on the following EV2 value: 45 MN/sqm. In order to provide sufficient space for working, which can also be compacted, the base area of the pit must exceed the tank dimensions  $\geq 400$  mm (for a trafficable version) and  $\geq 200$  mm (for an accessible version) on both sides.

With the accessible version, the tanks can be placed directly next to each other; with a trafficable version, the tanks  $\geq$  require 400 mm distance between each other.

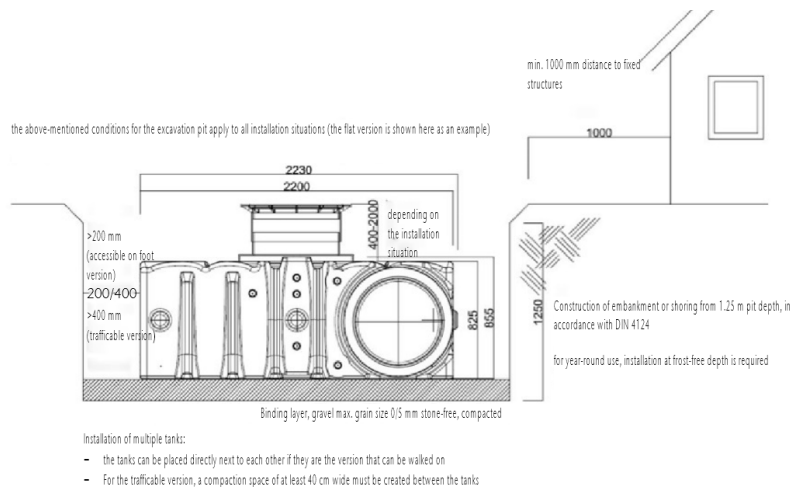
The distance between the excavation pit and fixed structures must be at least 1.00 m.

From a pit depth of  $> 1250$  mm, a slope according to DIN 4124 must be created (with or without shoring - depending on requirements and situation)

The depth of the pit must be dimensioned so that the maximum earth cover (see point 4 - Installation conditions) above the tank is not exceeded.

For year-round use of the system, the tank and the water-carrying system, components must be installed in a frost-free area. As a rule, the frost-free depth is approx. 600 mm (Northern Germany) to approx. 1200 mm (Austria); more detailed information can be obtained from the local authority responsible for the installation site.

A layer of gravel (max. grain size 0-5 mm stone-free, thickness approx. 100-150 mm) is applied and compacted as substructure/blinding layer.

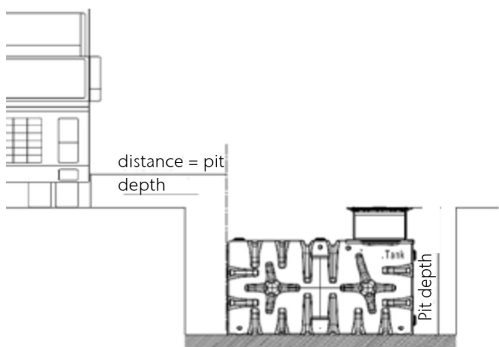


### 5.2.1 Slope, embankment, etc.

When installing the tank in the immediate vicinity ( $< 5.00$  m) of an earth mound, slope or embankment, a statically calculated retaining wall must be erected to absorb the soil pressure; the wall must exceed the tank dimensions by at least 500 mm and have a minimum distance of 1000 mm from the tank.

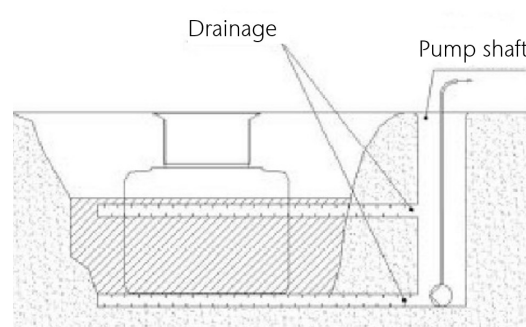
### 5.2.3 Installation next to traffic areas (e.g. roads)

If the underground tanks are installed next to traffic areas that are driven over by heavy vehicles (over 3.5 t) (e.g. adjacent road), the minimum distance between the tank and these areas should at least correspond to the depth of the pit.



### 5.2.2 Groundwater and cohesive soils

In the case of occasional groundwater and cohesive, poorly water-permeable or impermeable soils (e.g. loam/clay/silt), areas at risk of flooding and waterlogging, and areas with high groundwater levels, a 1.1 x safety margin against floating and deformation of the empty tanks must be ensured and adequate drainage of the groundwater or seepage water must be provided. A drainage pipe must end in a vertically installed shaft/pipe in which a submersible pressure pump is installed to reliably pump off the excess water. The pump must be checked regularly (see figure).



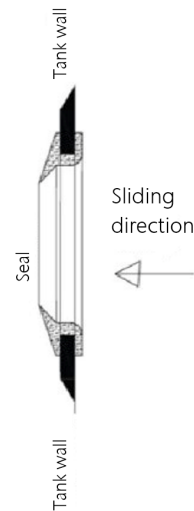
### 5.3 Connecting several tanks/pipe penetrations to the tank wall

The connection of two or more tanks is made via the mounting surfaces on the long or short side by using inserted special seals and underground drainage pipes (to be provided by the customer; recommendation: underground drainage pipe KG 2000 (green)); the openings, if they have not already been made at the factory, must be made exclusively with the crown drill included in the delivery or which can be ordered as an accessory. For the holes, depending on the installation situation, only the corresponding, visible drill markings are to be used in accordance with the following drawing, and then a rubber lip seal is to be inserted in each hole. The groove of the seal must be flush with the tank wall. The sliding direction is shown on the right (in the direction of the preformed rubber lip).

The following standards must be observed when laying the pipes:

DIN 1986 and DIN EN 752.

The pipes should each project 20 cm into the tank.



### 5.4 Inserting and filling

#### V.1) Flat installation -

possible extension on the long side:

both the overflows in the lower area and the piping for the ventilation in the upper area are fitted on the sides outside the tanks by assembling straight pipe sections and bends in the corners (1 x 90° (87°), 2 x 45° and 3 x 30° respectively); for the insertion of the seals/pipes see Sketch above

#### V.2) Flat installation -

possible extension on the short side:

The overflows in the lower area are placed on the sides outside the tanks, for the ventilation in the upper area a straight piece of pipe is placed between the joint surfaces at a 90° (87°) angle, this should be  $\geq 50$  cm long for the ventilation, so that when pushed together it is guaranteed that despite holding the pipe from the outside, at least 20 cm of pipe protrudes into each tank. For further details, see point V.1

#### V.3) Upright installation -

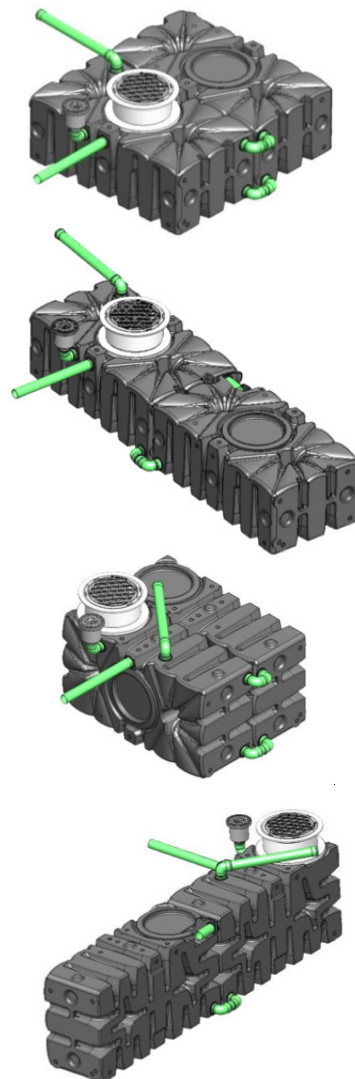
possible extension on the long side:

both the overflows as well as the pipework for venting are fitted on the sides outside the tanks by assembling straight pipe sections and bends in the corners; for further details see point V.1

#### V.4) Upright installation -

possible extension on the short side:

The overflows in the lower area are fitted on the sides outside the tanks, for venting in the upper area a straight piece of pipe is placed between the joint surfaces at a 90° (87°) angle; for further details see point V.1





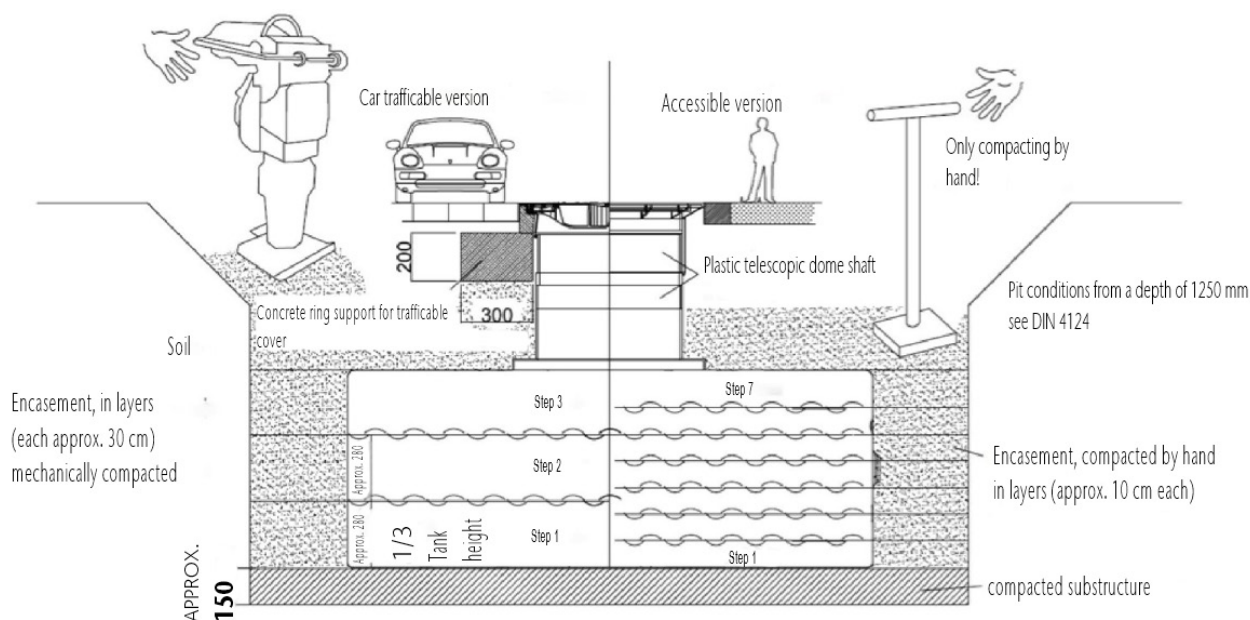


**Attention: only the version which is accessible by foot allows the tanks to be placed directly next to each other; the trafficable installation version requires the tanks to be placed at least 40 cm apart so that the area in between can be compacted!**

The tank(s) must be placed gently into the prepared pit using a suitable device.

To avoid deformation, the tank should be filled with water to the appropriate level before each layer is filled in; it must be ensured that the overflows to any further tanks are already connected to each other and that a uniform water level is established in these tanks. The encasement (gravel 0-5 mm, stone-free) is then filled in layers at the side and at least 20 cm above the tank and compacted; accessible version: in max. 10 cm steps with manual compaction with hand tamper

Trafficable version: in max. 30 cm increments with mechanical compaction (laterally with small vibratory plate, above with max. 1000 vibratory plate); care must be taken that mechanical compaction equipment does not come into direct contact with the tank. A base layer of recycled concrete or crushed stone 0-32 should be selected as the base course for a paving surface (compaction with max. 3000 vibratory plate); a maximum of 4 cm of crushed sand or chippings is used as the paving bed. Manual compaction is not possible in the two continuous narrow hollow webs; slurring must be used here.



### 5.5 Laying connections

The inlet pipe from the house to the tank should be laid with a gradient of at least 1% in the direction of flow; the overflow pipe from the main tank in the direction of the sewer or infiltration system should have a steeper gradient than the supply pipe. The tank overflow must be protected against backwater according to DIN 1986:

- a) for a pure rainwater channel with a backwater valve
- b) for a combined sewer using a lifting plant.

You will find various supplementary products in the ACO supply chain both for the options for subsequent infiltration and for protection against backwater. ([www.aco-hochbau.de](http://www.aco-hochbau.de); you can also find the responsible sales representative here).

All suction, pressure and control lines are to be routed through a reserve conduit (underground drainage pipe or similar), which is to be laid as straight as possible with a gradient to the tank and without bends. Necessary bends in this pipe run must be formed with a maximum of 30° fittings to avoid kinking of the pipes.

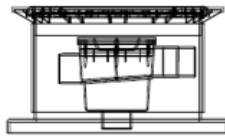
#### Important:

The above-mentioned reserve conduit must be connected to an opening above the maximum possible water level.

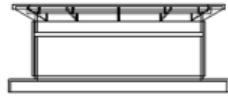
## 6 Dome shaft installation

### 6.1 Installing the dome shaft

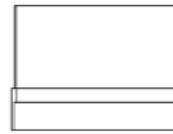
#### Products



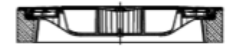
high sliding dome (with built-in tank filter for house & garden) with accessible cover



low sliding dome with accessible cover

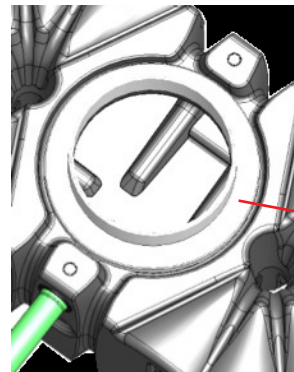


alternative:  
Dome extension

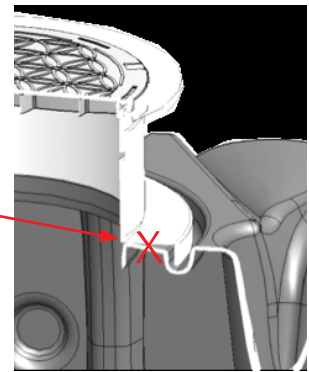


alternative:  
Trafficable cover

Depending on the design, the sliding dome allows the underground tank to be continuously adapted to existing ground surfaces with a ground cover of between 400 mm and 700 mm and can be modified to fit exactly by attaching the dome extension. The dome shaft base is placed on the predefined edge of the underground tank and screwed in place (at least 4 self-tapping screws crosswise); a sealing strip should be placed under the base (included in the scope of delivery), so that the transition between dome and tank is as seamless as possible; if the self-adhesive sealing strip is not pre-mounted, it should be applied to the edge of the base in a circular shape. If the high sliding dome is delivered with a mounted tank filter, there are 2 screws on the outside to secure the sliding area during transport. These screws can be removed and screwed in again from the inside of the dome to secure the position. After the area has been filled, the screws should be removed again to prevent a potential injury in the dome access.



Then follow the further steps as described in items 6.2 - 6.4.

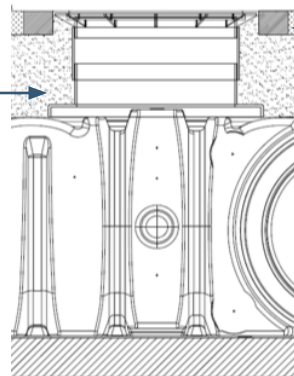


Finally, the chosen cover is put on; the screw connection on the cover must be tightened enough that it cannot be opened by a child!

### 6.2 Accessible version

To prevent the transfer of loads to the tank, the telescopic dome shaft must be filled with layers of gravel (max. grain size 0/16) and evenly compacted **by hand**.

It is important that both the dome and the tank are not damaged in the process, in order to ensure the long-term tightness of the construction..



The cover can be bordered with paving stones or similar, the remaining area should be covered with grass.

The same procedure must be followed with the water extraction box.

### 6.3 Trafficable version

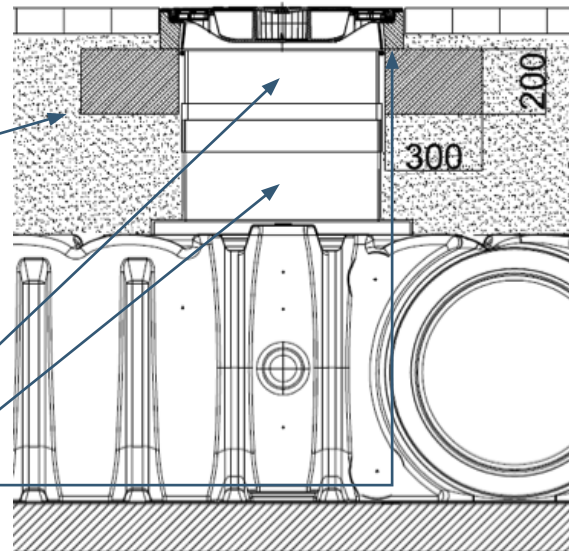
If the tank is installed under a surface that can be driven over by cars, then only an approved cover may be used, which must be installed separately from the tank. For this SAKU cover, which can be ordered as an accessory,

a ring-shaped support with a width of 300 mm and a height of 200 mm made of concrete C 20/25 must be provided. Alternatively, a finished concrete ring with similar dimensions can be installed

For further instructions, refer to the installation and operating instructions supplied separately with the cover. The dome is constructed from the following parts:

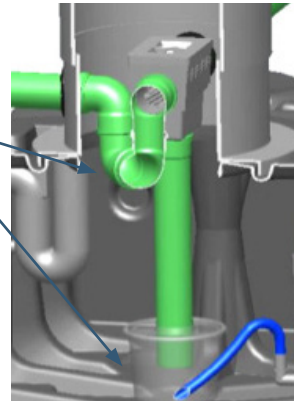
- Dome extension (see 6.5); this must be shortened to the lower edge of the SAKU
- Bottom part of the high sliding dome (see 6.1)

Sealing tape can/should be inserted at the upper edge of the dome extension in order to close the gap between the plastic dome and the concrete frame in a flexible and durable way (not included in the scope of delivery).



### 6.4 Built-in tank filter

If an in-tank filter is to be used (and it is not pre-installed), it must be fitted with a DN 100 underground drainage pipe through prepared openings with an inserted seal in the dome shaft (see also the sketch for the seal under item 5.2.4); a siphon must be formed as an odour trap

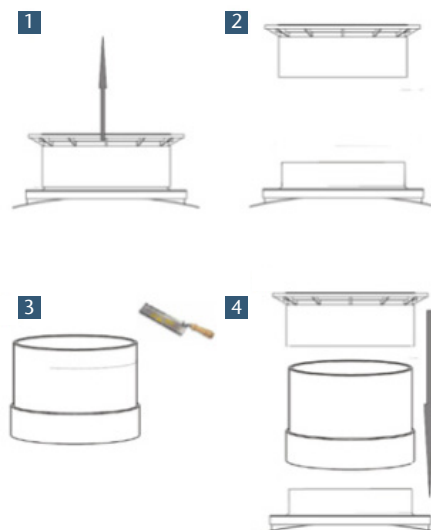


### 6.5 Alternative dome extension

If necessary, a dome extension can be inserted.

The main dome shaft parts are not changed here, the height is only adjusted via the dome extension.

The upper part of the dome shaft is lifted off, the lower part remains on the tank; after determining the exact height between the top of the ground and the edge of the dome shaft, the dome extension is shortened with a suitable saw if necessary. Now the dome extension is placed between the lower and the upper dome shaft parts. The subsequent procedure is described under points 6.1 - 6.3.





## 7 General installation aid for complete packages

As an installation aid, you can easily refer to the brochures to see which parts are connected to each other.

### **Please follow the instructions supplied with each unit.**

- Carry out the installation of the underground tank in accordance with the installation instructions.
- Connect the downpipes that are to be connected to the underground tank to the rainwater inlet on the underground tank and the overflow to the drainage channel, infiltration system or other drainage systems.
- If you have purchased a house system to supply your toilet and/or washing machine, or would like to install a level indicator in the house for your garden, install a DN 100 underground drainage pipe/ KG 2000 underground drainage pipe from the house connection on the underground tank to the utilities room in the building. Please make sure that the reserve conduit is laid with a gradient of at least 2% to the underground tank, so that condensation water cannot run to the building. If possible, use a maximum of 30° or 45° bends and branches (e.g. to the water intake box) so that the rainwater hoses do not kink.
- To close the underground drainage pipe in the house, a wall penetration seal should be used, which is inserted directly into the DN 100 underground drainage pipe. For the house and garden set, the opening for the water connection box (if not ordered separately) must be closed with the appropriate underground drainage pipe and cover.
- The emergency overflow at the top of the tank may need to be shortened slightly so that the skimmer edge is below any other openings. This ensures that the surface water drains off before it reaches the upper tank connection or one of the reserve conduits (e.g. to the water extraction box in the garden sets).

- Proceed - depending on the equipment package

#### **a) Home and Garden Professional:**

install the fully automatic rainwater control unit in the utility room and lay the suction hose from here to the underground tank (through an appropriate reserve conduit)

#### **b) House and Garden Compact:**

place the underwater pressure pump in the underground tank. Use a rot-proof rope or something similar to secure the pump upwards in the dome shaft and place it upright in the tank. This also makes it easier to remove the pump from the underground tank if necessary.

Lay the rainwater pressure hose (through a reserve conduit with a gradient to the underground tank) from the pump to the utility room and connect it via a shut-off ball valve to the rainwater pressure pipe to your toilet, washing machine etc.

The next step is to connect the drinking water pressure line to the free drinking water feed and connect the inlet connection of the feed with heat resistant and underground drainage pipes to the underground tank.

**Important:** Pay attention to the gradient all the way to the underground tank! It is advisable to form a siphon as an odour trap. If the after run is not sufficiently backwater-proof, a backwater protection must be planned. (e.g. ACO Triplex DN 50, mounting on the wall in front of the wall penetration). Lay the pump cable and the cable from the float switch of the drinking water supply from the underground tank to the utility room.

**Important:** Now plug the adapter plug of the float switch into the socket and the plug of the solenoid valve into the adapter plug.

**Important:** If there is no water in the underground tank, water will continue to run until the float switch in the underground tank rises and the solenoid valve closes.

As soon as there is enough water in the underground tank (pump completely covered), please insert the plug of the underwater pressure pump into a live socket. The system starts working and the pump fills all rainwater pressure pipes in the house.

**Important:** First check that all fittings, connections and hose clamps are tightened. Please make sure that after all pipes are filled, the pump in the underground tank switches off and only switches on again when you open a consumer (toilet flush).

#### **c) Garden Plus:**

Find a suitable place for your water connection box near the underground tank and lay a protective pipe/reserve conduit e.g. Underground drainage pipes DN 100/KG 2000 from the tank to the water connection box. When laying the reserve conduit, it is advisable to lay the rainwater pressure hose from the underwater pressure pump to the water connection box through the reserve conduit and connect it to the ball valve. Now connect the hose to the pump and lay the pump cable in an empty conduit to a live socket. Please secure the pump with a non-rotting rope or something similar at the top of the dome shaft in the underground tank. This also makes it easier to remove the pump if necessary. Once you have tightened all connections and hose clamps, the ball valve in the water connection box is closed and the underground tank is filled with water, plug the pump plug into a live socket.

**Important:** The pump starts and as soon as the pressure in the pipe has built up, the pump switches off again. If you now open the ball valve, the pump is automatically switched on and vice versa. To make the system winterproof, remove the pump plug from the live socket and open the ball valve in the water connection box. Your system is now winterproof.

#### **d) Garden Basic:**

Find a suitable place for your water connection box near the underground tank. Lay the suction hose through a underground drainage pipes /KG 2000 pipe DN 100 to the water connection box. Guide the suction hose through the perforated bottom of the water connection box and attach a hose coupling above the bottom. This prevents the hose from slipping into the tank. Fill the pump and the entire suction hose with water and connect the hose in the water connection box to the short piece of hose with coupling on the pump (suction side in front). Connect a garden hose, for example, to the top of the delivery side. As soon as you now insert the plug into a live socket and, if necessary, turn the switch, the pump delivers water. Pull the plug or flip the switch to turn the pump off again.

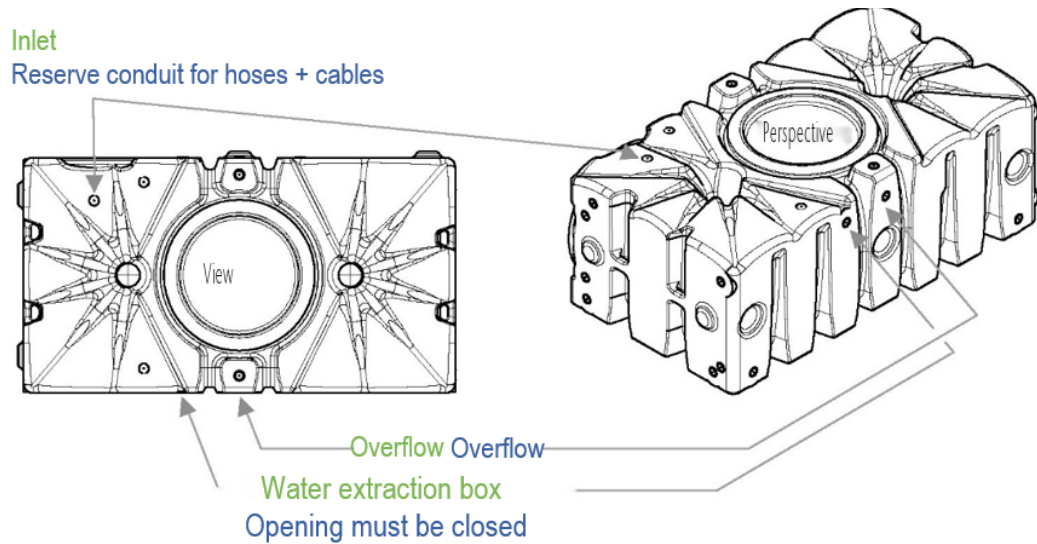
To make the system winterproof, remove the suction hose from the hose section of the pump and store it in the water connection box. Take the pump, drain the pump completely and place the pump in a dry, frost-free, well-ventilated place. Your system is now winterproof.

## 8 Note: Installation of tanks from the modular system

### Using the prefabricated openings on the tank

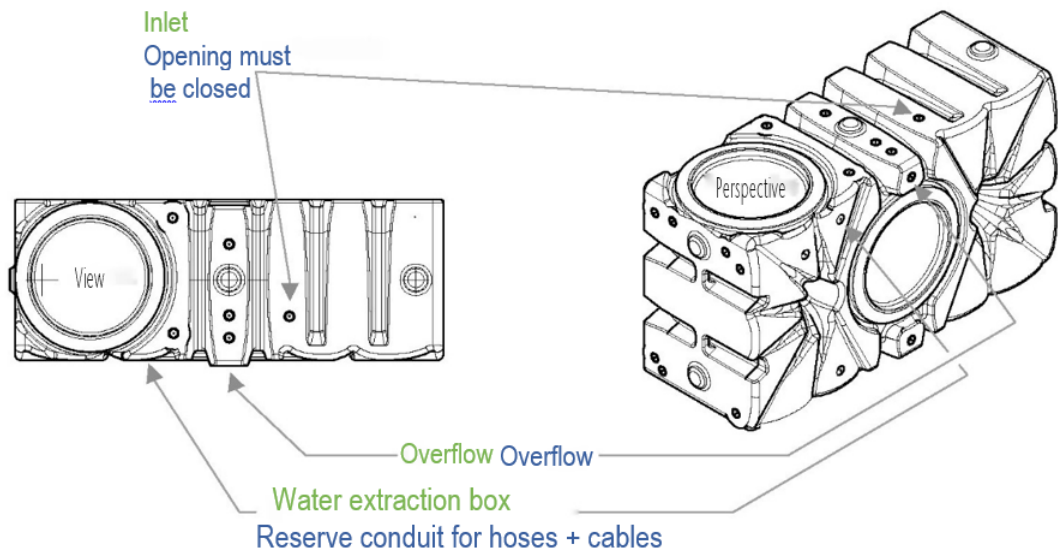
#### Horizontal installation:

- Garden use only
- House and Garden use



#### Vertical installation:

- Garden use only
- House and Garden use



## 9 Inspection and Maintenance

Regular inspection and qualified maintenance increase the operational and functional safety, extend the service life and prevent structural damage and unscheduled repairs. Non-compliance with the intervals specified in the following can lead to the functional capability of the system being impaired and the liability for any resulting damage

### Monthly inspection

- Actuation of the manual emergency lock on any backwater valves
- Inspection of possible wastewater lifting plant for operability, leak tightness, external corrosion

### Inspection every six months

- Check roof drains and overflows for unimpeded drainage and tightness; dirt traps must be cleaned; check heating if necessary
- Inspection of gutters and rainwater downpipes for tightness, cleanliness, fastening, heating if necessary and protective coating; clean filters
- Visual inspection of the switching cycle of the operating water pump for operability and tightness
- Testing the system control by observing a switching cycle of the pump system
- Testing of water traps for cleanliness, water level, tightness and, if necessary, shut-off

### Annual maintenance

- Cleaning the filter(s)
- Controlled test run of the operating water pump with testing before, during and after the test run: electrical safety protection of the pump system in accordance with VDE regulations, possible pre-pressure of the diaphragm tank, tightness of the mechanical seal of the pump, function of the backflow preventer, pump and flow noises, tightness of the system and fittings, cleanliness of the system, corrosion of the system components
- Controlled test run of the system control with check before, during and after the test run:
- Switch-on and switch-off points of the system, refilling (solenoid valve)
- Inspection of a possible wastewater lifting plant for leak tightness, function, checking the level switch, setting heights of input, output and alarm levels; checking the flow inhibitors for leak tightness

being waived. Inspections may be performed by the system operator. Maintenance and repair work must be performed and documented by properly qualified technicians.

The following time periods should be taken into account:

### Annual inspection

- Checking the filter condition of the filter system
- Testing the reservoir for cleanliness, tightness and stability
- Check the safety distance (water level) of the inlet and overflow, and, if necessary, visually check the aeration and ventilation
- Comparison of the fill level in the reservoir with the fill level indicator
- Check the visible cables for condition, tightness, fastening and corrosion
- Checking the water meters for function and tightness
- Check the tight closure of the backflow preventer/backflow flap, if fitted (by manual operation)
- Check the wastewater lifting unit for operability, leak tightness and corrosion if present
- Testing of any tapping fittings for leaks and any changes in the water with regard to odour, colour and suspended solids
- Checking the flushing process of flushing equipment (cisterns, pressure flush valves etc.), if necessary correction of the flushing water volume
- Checking the labelling of all pipelines and tapping points

### Maintenance every 10 years

- Emptying the rainwater storage tank, cleaning the inner surfaces of the tank, removing the sediment if necessary (base tank)

**Note: We recommend the ACO Stormbrixx seepage kit if too much rainwater is seeping away**

The piping from the tank to the sludge trap and then on to the Stormbrixx must have at least the same diameter as the feed pipes to the tank and a gradient of at least 2°.

#### Application example

