Innovations for clean water

PUROO®

Installation Instructions

Content

Dear customer,

at this point we would like to thank you for the trust which you have shown with the purchase of this product.

On the following pages you will find everything necessary about the installation, operation and the maintenance requirements of your PUROO® small wastewater treatment plant.

The general information and installation conditions are presented on the first pages with representations of the PUROO® components in the concrete tank. The details for the installation can be identified using an example of an installation in a plastic container (Type: Graf).

Please observe that the careful installation of the wastewater treatment plant is very important for a good treatment performance.

Brief description of the plant

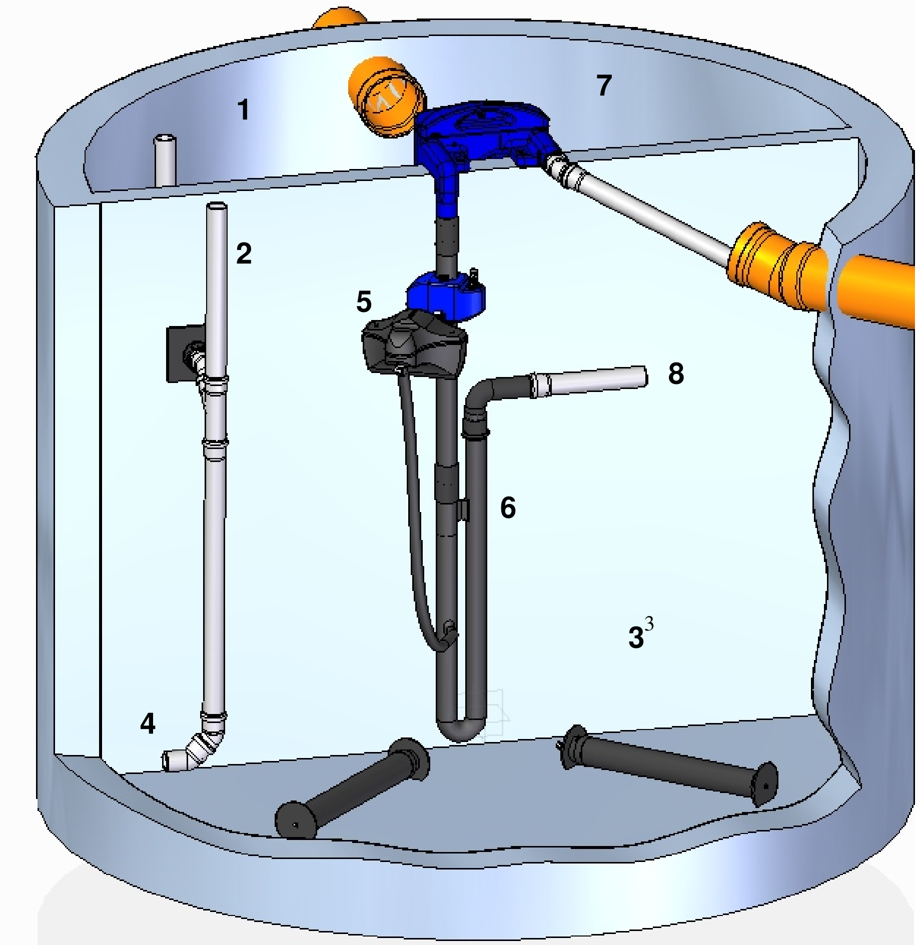
The water arrives in the pre-treatment stage [1] of the plant for mechanical preliminary purification.

The pre-treated wastewater is conducted via the overflow baffler [2] in to the bottom area of the SB reactor [3] . In order to avoid possible turbulence of the activated sludge, during the settling phase or of the clarified water removal, the outlet of the overflow baffler [4] is directed towards the tank outer wall.

On reaching H_{Wmax} the float valve [5] switches over and the settling phase/return sludge feed is initiated. Short lifting strokes transport the excess sludge into the pre-treatment stage [1] or subsequently flush the air lift pump [6] using treated wastewater.

With the clarified water removal the outlet of the buffer tank in the direction of the pre-treatment stage [1] is closed and the treated wastewater is transported via the purged sampling section of the buffer tank [7] into the outlet.
The overflow baffler is turned in the opposite direction in the intake area [8] of the air lift pump [6], thus avoiding the influencing of the quality of the discharged clarified water through overflowing untreated wastewater.

On reaching H_{Wmin} the float valve switches over to aeration and a new cycle starts.



1 Preliminary purification
2 Overflow baffler
3 SB reactor
4 Outlet
5 Float valve
6 Air lift pump
7 Buffer tank
8 Intake area

Scope of delivery

<table>
<tr><th rowspan="3">Pos</th><th rowspan="3">Designation</th><th colspan="3">Spezifikation</th></tr>
<tr><th>Poly
1-10</th><th>¼ chamber
1-10</th><th>½ chamber
1-16</th></tr>
<tr><th>0020 0005</th><th>0020 0001</th><th>0020 0003</th></tr>
<tr><td>1</td><td>ATBControl 1 on mounting bracket</td><td colspan="3">1</td></tr>
<tr><td>2</td><td>Compressor JDK-S-80/100</td><td colspan="2">80</td><td>100</td></tr>
<tr><td>3</td><td>PUROO® TANK</td><td colspan="3">1</td></tr>
<tr><td>4</td><td>PUROO float valve complete unit</td><td colspan="3">1</td></tr>
<tr><td>5</td><td>PU-tube diffuser 570/820 mounted</td><td>1x570</td><td>1x820</td><td>2x820</td></tr>
<tr><td>6</td><td>Overflow baffler PUROO®</td><td colspan="3">1</td></tr>
<tr><td>7</td><td>Clearwater suction pipe</td><td colspan="3">1</td></tr>
<tr><td>8</td><td>ATB-airlift complete unit standard</td><td colspan="3">1</td></tr>
<tr><td>9</td><td>Clearwater pipe set PUROO®</td><td colspan="3">1</td></tr>
<tr><td rowspan="2">10</td><td>Compression fitting overflow baffler [K]</td><td rowspan="2">M</td><td colspan="2" rowspan="2">K</td></tr>
<tr><td>Mounting bracket PUROO® [M]</td></tr>
<tr><td>11</td><td>Mounting parts PUROO® 1-16 PE</td><td colspan="3">1</td></tr>
<tr><td>12</td><td>Fabric hose DN16 clear 18 m coil</td><td colspan="3">1</td></tr>
<tr><td>13</td><td>Operating instructions PUROO®</td><td colspan="3">1</td></tr>
<tr><td>14</td><td>Installation instructions PUROO®</td><td colspan="3">1</td></tr>
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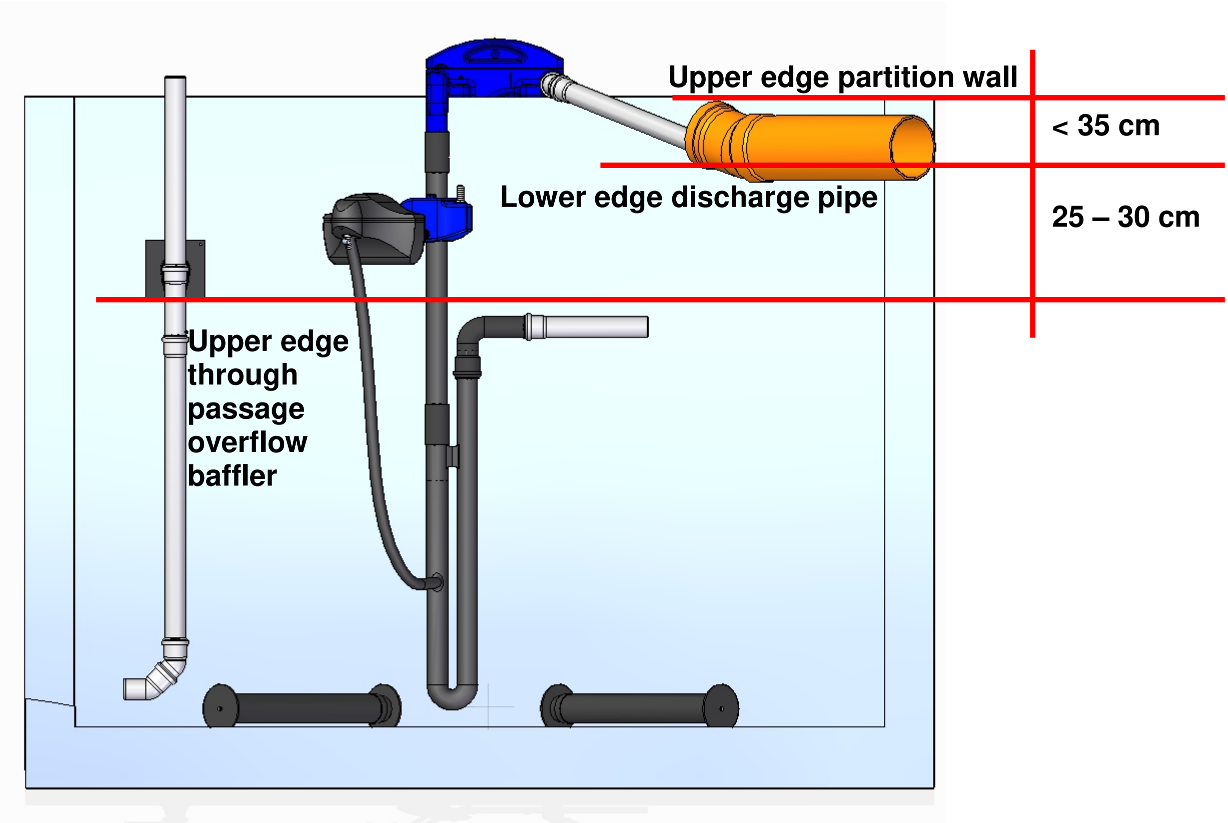
General information on installation (using the example of a concrete tank)

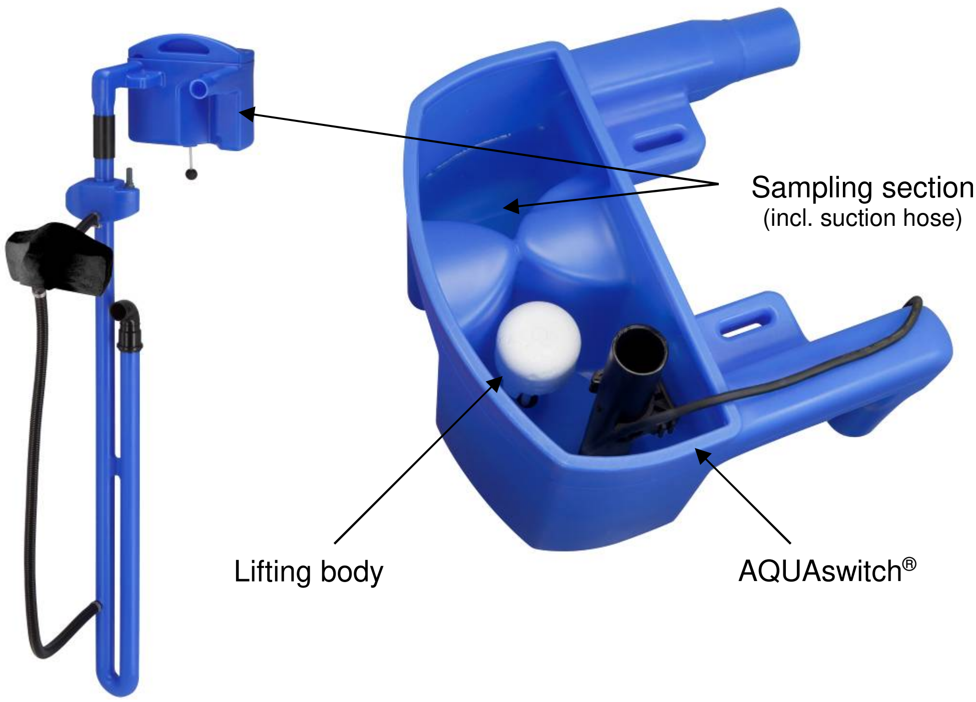


- Partition wall between primary treatment /biology stage must be sealed.
- Tank must be checked for watertightness.
- Cover with ventilation openings or alternative aeration of the plant must be available.
- Empty DN 100 pipe for the control system is laid (max. separation 10 m).
- Max. separation lower edge of discharge pipe to upper edge of partition wall 0.35 m. (With larger separation the delivery rate of the air lift pump is possibly insufficient. For queries please call by phone).
- The opening for the charging of the SB reactor (Ø > 50 mm) must be attached 25-30 cm below the discharge pipe (below H_{Wmin}).

Further prerequisites for the secure operation of the plant

- Empty pipes are to be at least DN 100.
- Cables and hoses in the chambers are to be so mounted that they do not hinder the sludge disposal.
- Freely moving cables and hoses should not be capable of being damaged by fixed objects.
- A fully functioning ventilation and aeration must be ensured. Normally this is effected by the roof ventilation and the cover with ventilation openings in the (last) tank or air ventilation in the outlet pipe. The operational capability is to be documented and verified.
- With underground pipes DIN EN 752 is to be observed and their watertightness is to be verified in accordance with DIN EN 1610. All pipes (also empty pipes) are to be laid with a minimum incline > 1% to and from the wastewater treatment plant.
- The pipes are to be sealed at all connections of the wastewater treatment plant. Hoses must be laid free of kinks and, as for the openly laid pipes, so fixed using clips and und supports that, with correctly executed work on the plant, they cannot be damaged.
- Inlet and outlet pipelines / openings are to be designed in such a way that blockages and/or constriction of the free cross-section are not possible.
- With single chamber primary treatment the inlet must be fed through an attached bend opposed to the overflow baffler in order to prevent a transfer of fibrous materials.
- The discharging of inflammable or other substances which can lead to the formation of an explosive atmosphere is prohibited (see also Notes on Disposal in the Operating Manual).
- The empty pipe for the control system is to be sealed gastight.
- With the laying of electrical lines the DIN VDE Instructions are to be observed.
- The commissioning of the plant is to take place promptly following the installation or after the first discharge of wastewater.
- With longer or final decommissioning the plant is to be emptied completely and is to be cleaned.

PUROO® - Tank



Installation of the plant components – overflow baffler

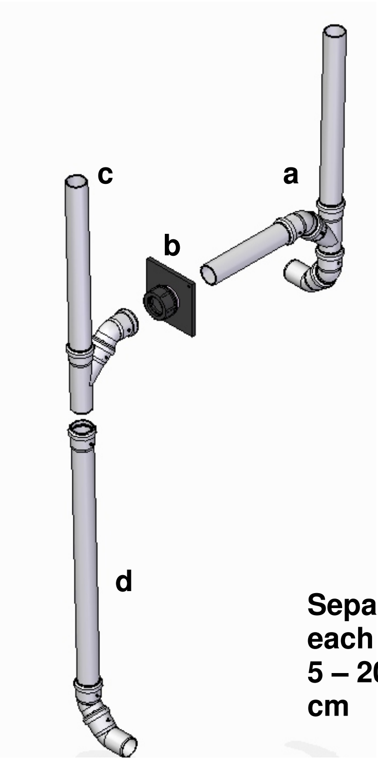
The overflow baffler is delivered pre-assembled and is to be pieced together in the tank.

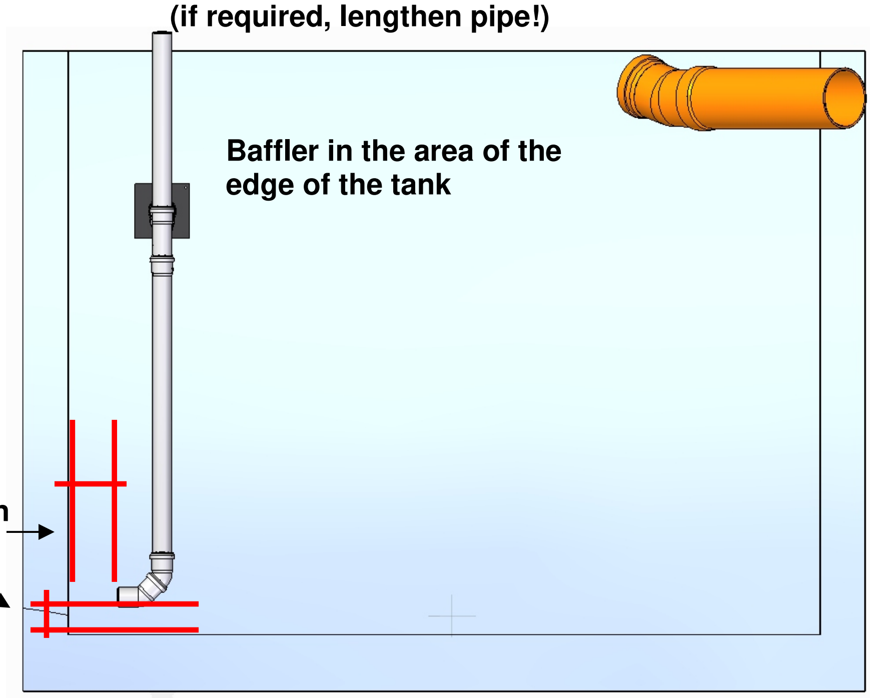
The T-piece [a] with a 90° (2x45 °) bend, attached to the small end, is pushed from the primary treatment stage through the opening of the partition wall. The bends must be turned into the far side from the inlet.

With concrete tanks, push the connection [b] from the SB reactor onto the pushed-through pipe end and secure the connection to the partition wall using a screw. If the plate of the connection sits flush on the partition wall it is not necessary to seal the opening.
With poly-tanks, the baffler is fed through a lip-seal in the partition wall and does not require to be attached using the connection.

Attach the T-piece [c] in the SB reactor to the fixed pipe and feed the baffler with the extension to the bottom of the tank towards a tank wall (separations see diag. below).

The connections must be secured against turning using screws!





Installation of the plant components – preparation of the pipe set

The pipe set incl. buffer tank, is supplied as prepared, flexible plug-in set, which is put together with little effort before installation.

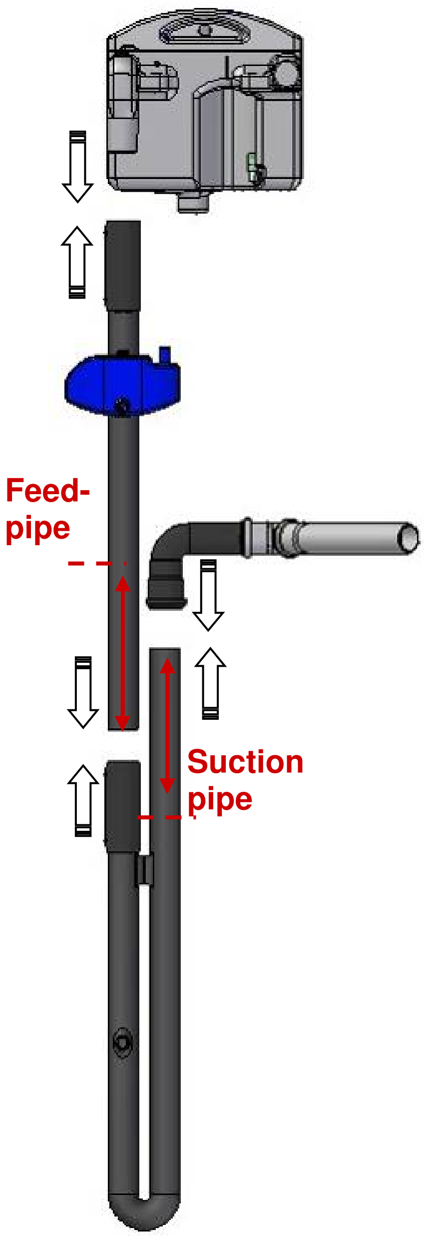
With the pipe set, as a rule, all standard septic tanks according to DIN 4261 Part 1 with partition wall can be equipped up to 16 PT. The appropriate technical wastewater calculation is to be followed.

The pipe set is supplied for partition wall heights > 1.67 m.

With smaller partition wall heights, the pipe set must be shortened at two positions (see marking diag. left) and the flexi-hose shortened by the difference between 1.67 m and the actual partition wall height. The suction pipe is to be shortened by a max. of 31 cm (see table below)!

Before assembly remove the transport retaining band on the outlet of the buffer tank!

The pipe set is to be plugged together before installation as shown in the diag. and the pipe connections are to be secured with a screw.



Pipe set reduction table

Partition wall height [cm]	Reduction feed pipe + flexi-hose [cm]	Reduction suction pipe [cm]
160	7	7
150	17	17
140	27	27
130	37	31
120	47	31

The minimum partition wall height is 1.20 m.
Intermediate measurements are to be interpolated.

Installation of the plant components – Installation of the plant

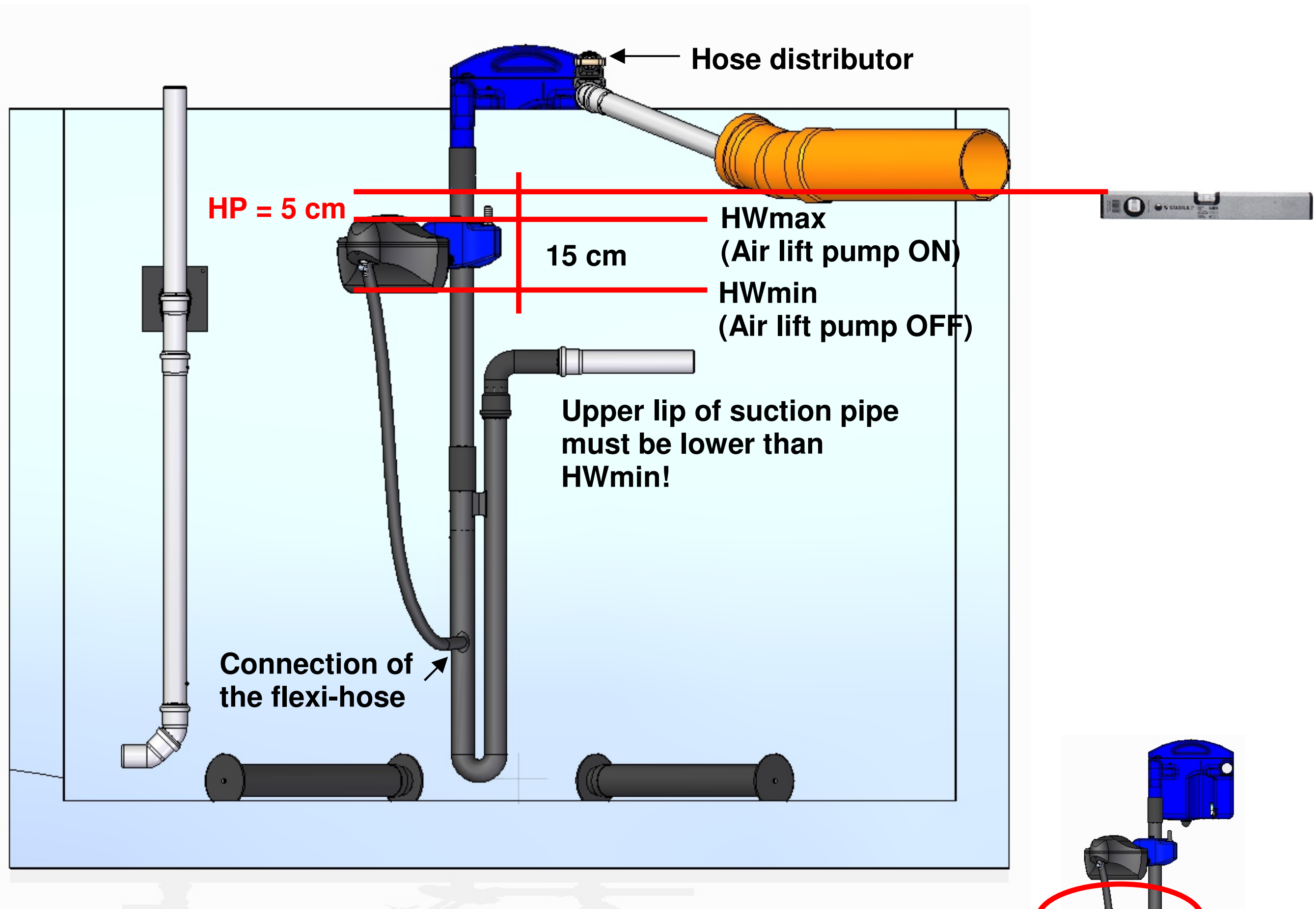
After installing the overflow baffler secure the assembled pipe set to the partition wall using the 5x70 mm screws. The height of the outlet is relevant for the position of the float valve bracket. The bracket must be so adjusted and secured that the upper edge of the bracket (HWmax) is 5 cm below the outlet pipe or inlet into the attached bend. (Tip: 5 cm = height of spirit level)

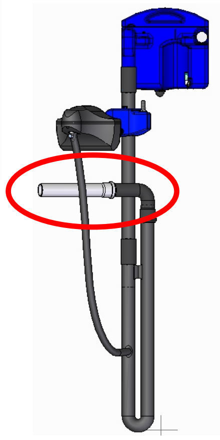
After securing the float valve, check that the flexi-hose moves freely and the float valve moves freely between lower and upper switching point!

Connect the buffer tank to the outlet of the tank. Arrange the outlet so that, with pumping out, no water can run back (e.g. attach a 30° bend).

Connect the hose from the air lift pump and the pipe aerators together with the quadruple hose distributor (diag. above) and lead the air hose together with the float switch lead to the control system.

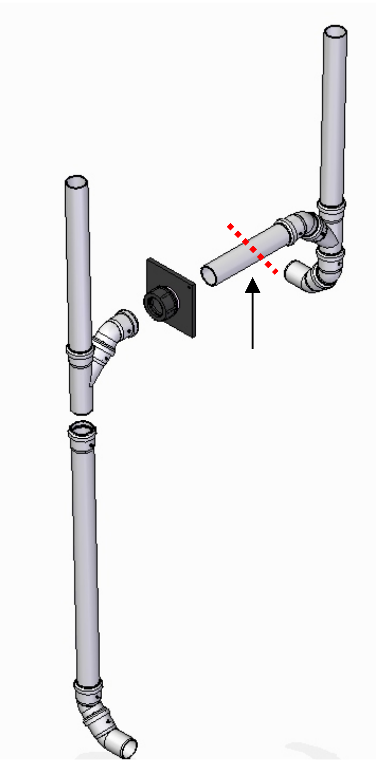
The suction pipe can also be turned depending on the position of the overflow baffler (see diag.).

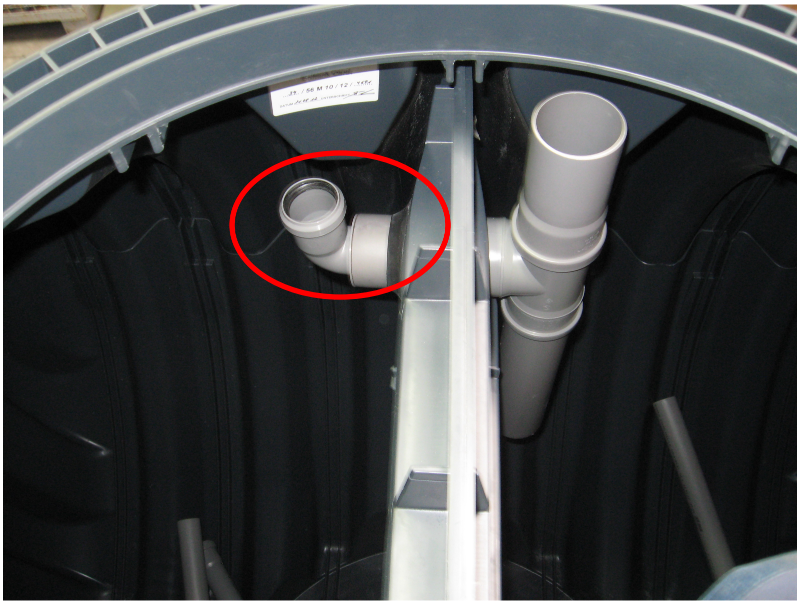


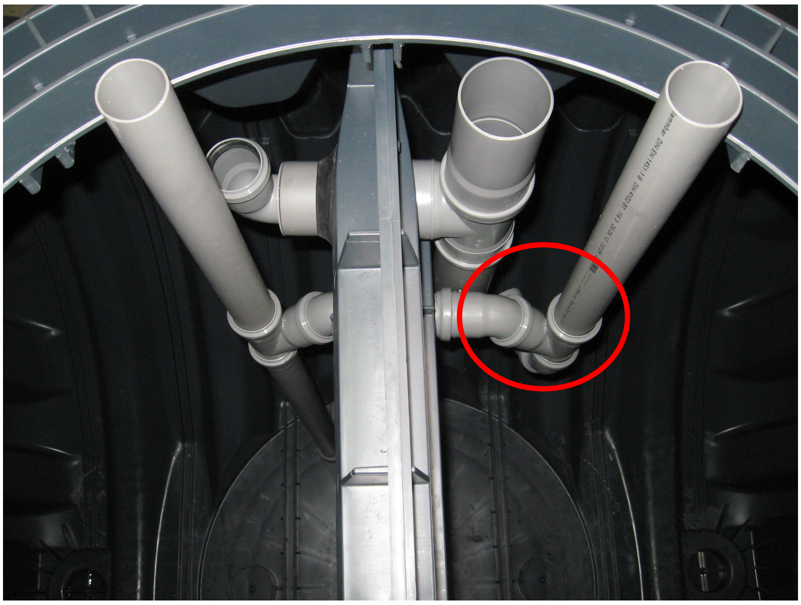


Detailed photographic instruction (using the example of Graf poly-tanks)

The overflow baffler is placed in the ATB SBR tank directly alongside the existing emergency overflow. Deactivate the existing emergency overflow using a bend which is fitted pointing upwards.





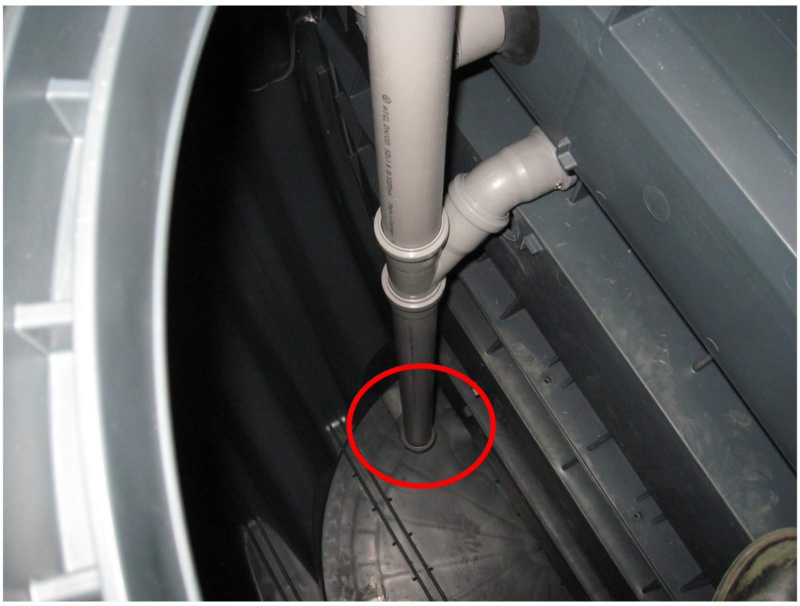


Shorten the overflow baffler at the marking for installation in Graf tanks (see diag. above).

Assemble the baffler in the tank and secure this to avoid rotation using the available screws.

Rotate the bend on the primary treatment side in the opposite direction to the inlet in order to achieve an effective retention of coarse materials.

Rotate the bend near the bottom on the biological side in the direction of the outer wall (see markings diag. right).



Measuring the height of the partition wall.
The pipe set, with partition wall heights smaller than 1.66 m, are shortened (see page 8 and diag. right).

Tank type	Height of partition wall [cm]	Shortening of feed / suction pipe and flexi-hose [cm]
Graf 3750 l	139	31
Graf 4800 l	161	10
Graf 6500 l	187	-

Assemble the pipe set as shown in the diag. right and secure the sleeve using the inserted screws.

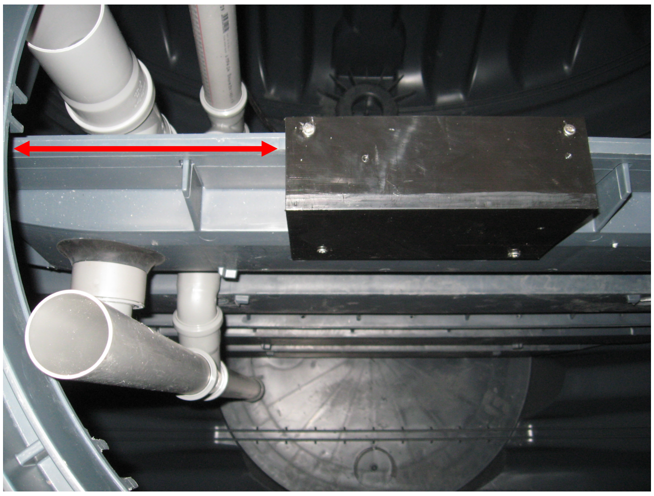
Determine the position of the float bracket on the air lift pump: the bracket is so secured for height (diag. right), that the upper edge lies 5 cm below the outlet (see page 9).

Fit the air distributor, which can be found in the assembly material, to the clarified water outlet and connect this with the connection to the float bracket.

- Quarter-chamber/poly-half-chamber: triple distributor
- Half-chamber: quadruple distributor

Before starting the plant remove the transport locking device on the buffer tank outlet (see marking top diag.)!

Before starting place the sampling hose upwards in the tank! Later on in the assembly this should be secured to the cone for easy accessibility.

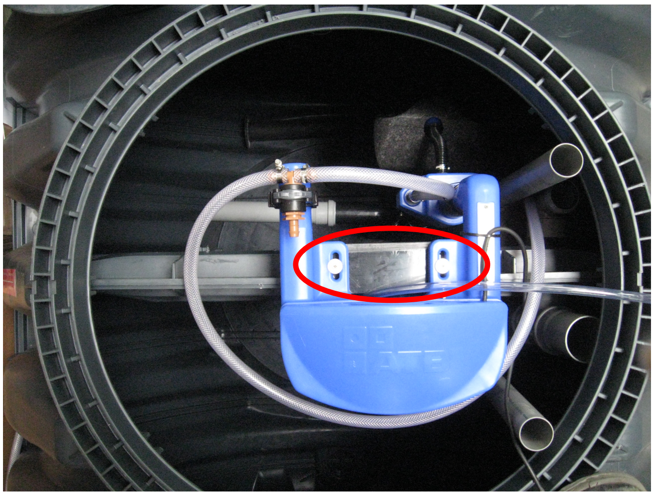


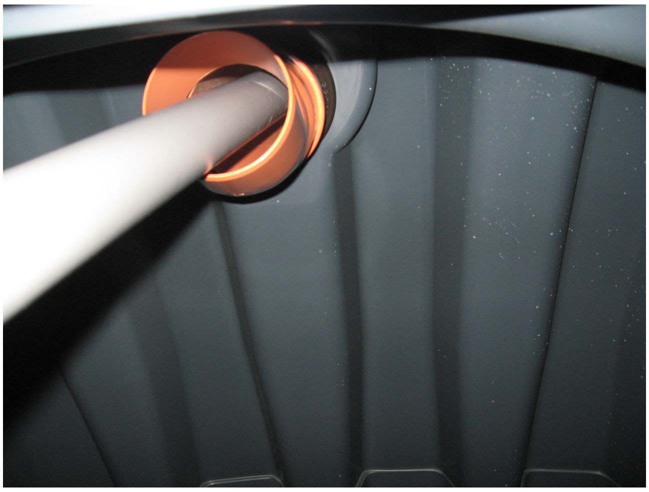
Before installing the pipe set, fit the assembly bracket on the partition wall.
The bracket must have a separation of 20 cm to the cone opening on the overflow baffler side (see diag. centre)!

Place the pre-assembled pipe set on the assembly bracket and push this on until the float bracket is in contact with the baffler.

Secure the pipe set to the assembly bracket using the screws (marking diag. bottom right).

Place the pipe aerator centrally in the biological stage and lead the air hose behind the overflow baffler and alongside the combi-tank to the air distributor.
Thus it is ensured that the air hose does not hinder the function of the (diag. below left/right).

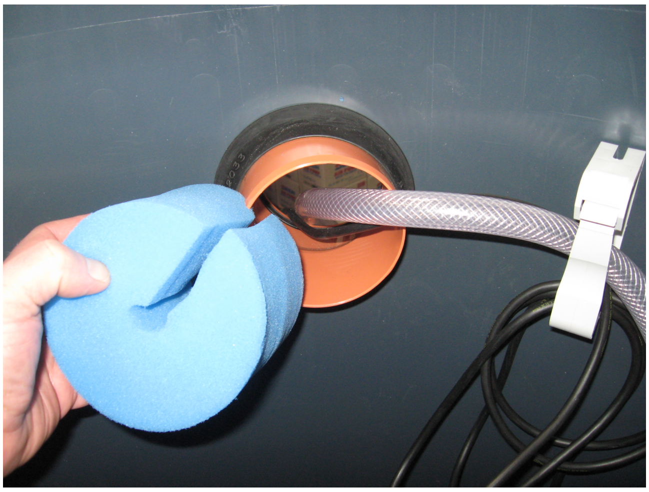




Using the pipes and bends contained in the shipment, connect the clarified water outlet to the drain.

Preferably, place a bend of at least 15° on the drain and feed the clarified water pipe at least 20 cm into the drain in order to prevent a flow back of the discharged water.

Place the cone onto the tank.
The inlet to the tank is led into the cone and with an attached T-piece and DN 110 bend (not contained in the shipment) is led from the buffer tank in the direction of the outer wall.
For this the cone is mounted, rotated ca. 45 degrees (see diag. below).



Connect the air hose to the distributor and lead this, together with the lead to the float switch, through the empty pipe to the control system.

Close the empty pipe using the plugs supplied (see diag. centre) and additionally seal the pipe using, if possible, an airtight material.

Lay the air hose, sampling hose and the lead to the float switch so that the float valve is not hindered in its movement!

To lead and secure the above given line and hoses use the white cable clip which is fixed in the cone (marking diag. bottom).

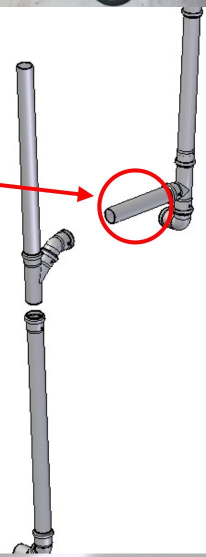
Short instruction for PUROO®-installation in Aplast-tanks

The installation in the tank type Aplast is comparable with the installation of the system in Graf tanks.

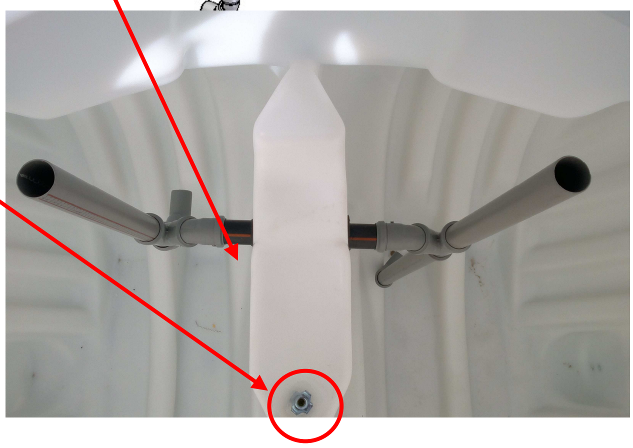
Two separate PUROO® versions (4/6 EW + 10 PE) are available for the three Aplast tank sizes.
Airlift and flexible hose are delivered with the adapted length and mounted float valve holder. In addition, a *stepped pipe* is used to connect the airlift to the PUROO® tank, which compensates the offset in the lower area of the dividing wall (see illustration on the right).
These parts do not need to be adapted.

Install the system analogously to the Graf variant (page 11 ff.).

As standard, a connecting pipe is inserted through the dividing wall, onto the parts of the overflow baffle are plugged (for details on mounting the overflow baffle, see page 10). The connection pipe of the overflow baffle must be removed first.



For fixing airlift set and PUROO®-tank screw collars are inserted in the dividing wall (see illustration on the right and also on the next page).

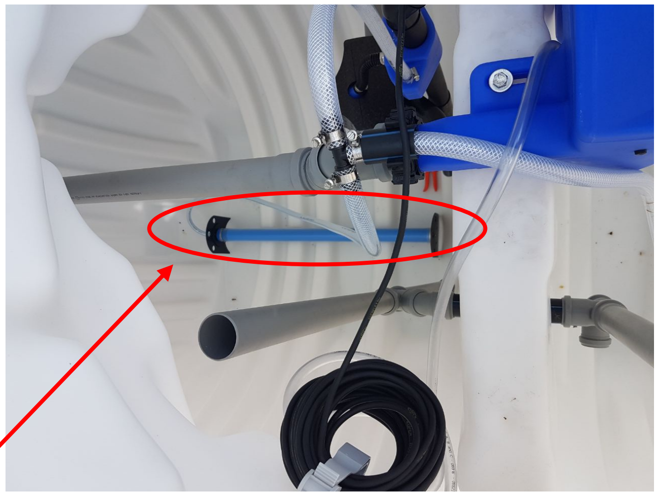


Place the PUROO on the dividing wall and fix it with M8 screws in the long holes.

Place the tube diffuser centrally in the SBR chamber and lead the air hose to the air distributor in such a way that the function of the floating valve is not obstructed during operation (Fig. right)..

Pipe diffuser details:
There are differences in the lengths used and the alignment of the tube diffusers for the three tank variants.

4/6 EW variants:
A 570 mm long tube diffuser is placed in a rib parallel to the divding wall (see marking above).



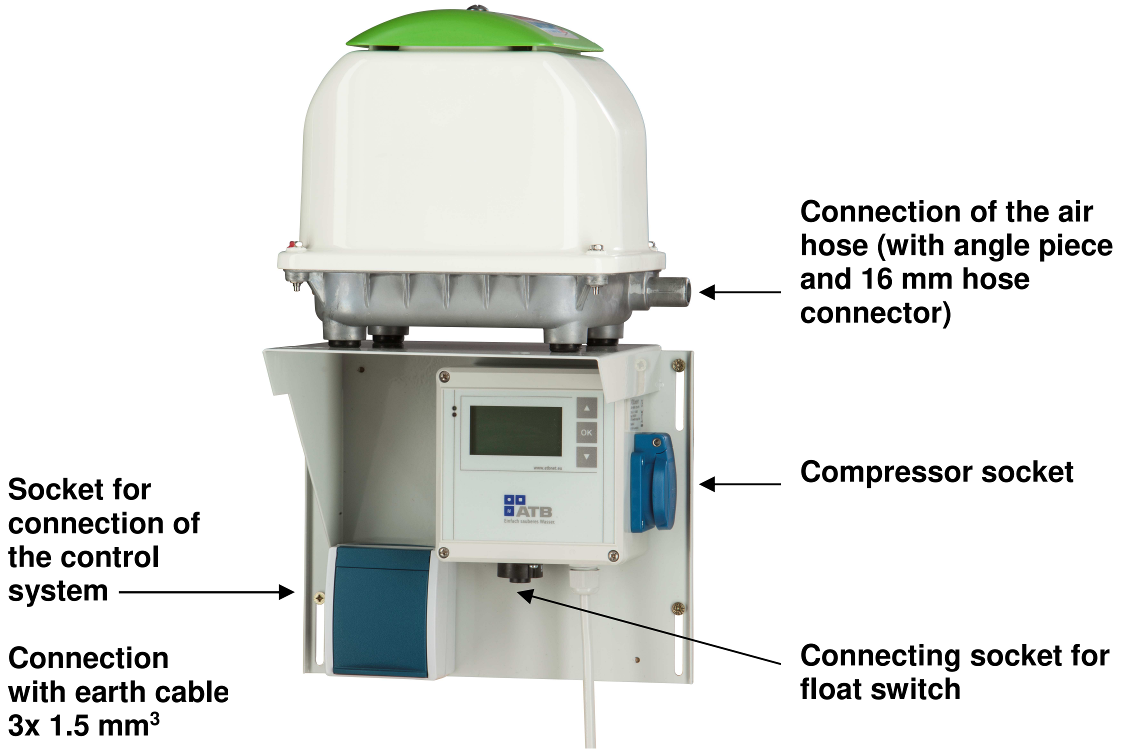
With the 10 EW variant, a 1070 mm long tube aerator is positioned on the tank bottom in the longitudinal direction of the tank (marking on the right).
Enlarged spacers are mounted on this tube diffuser to prevent the membrane for the contact with the tank bottom.

The tube diffuser should be inserted into the tank in such a way that the air connection points is in the direction of the drain. This allows the aerator to be lowered and aligned easily from the tank opening.

Commissioning of the control system
(To be carried out by skilled personnel only)

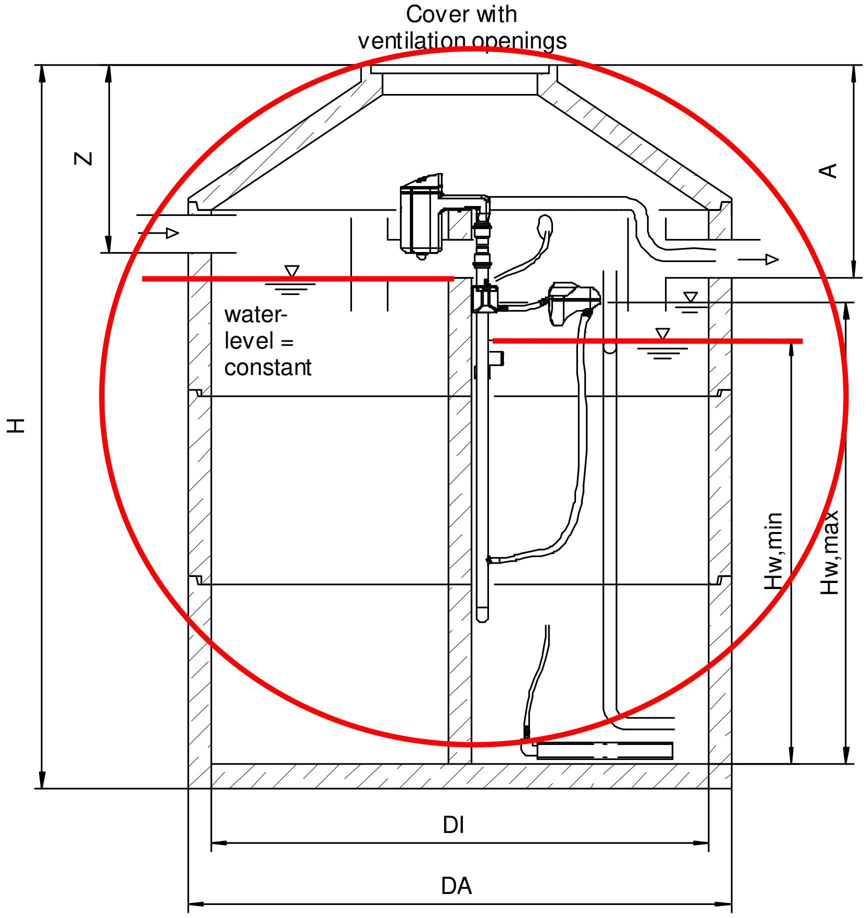
Example: Compressor + control system on console

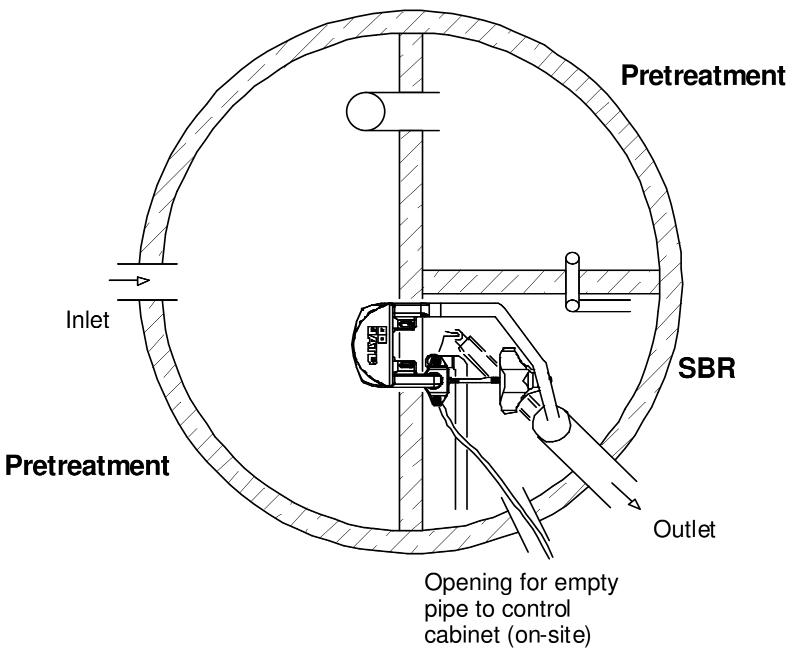
With the selection of the location of the control box bear in mind that direct radiation from the sun is to be avoided!



Install the control unit either directly to the console on a stable wall or in the cabinet which can be supplied as accessory (inside cabinet/open air column). The maximum separation between tank and mounting location of the control unit may not exceed 10 m.
Following the drawing though of the air hose and the float lead the empty pipe is to be closed airtight using the plugs supplied (see diag. below) and, if required, additionally sealed using polyurethane foam or mortar!

Installation in concrete quarter-chamber



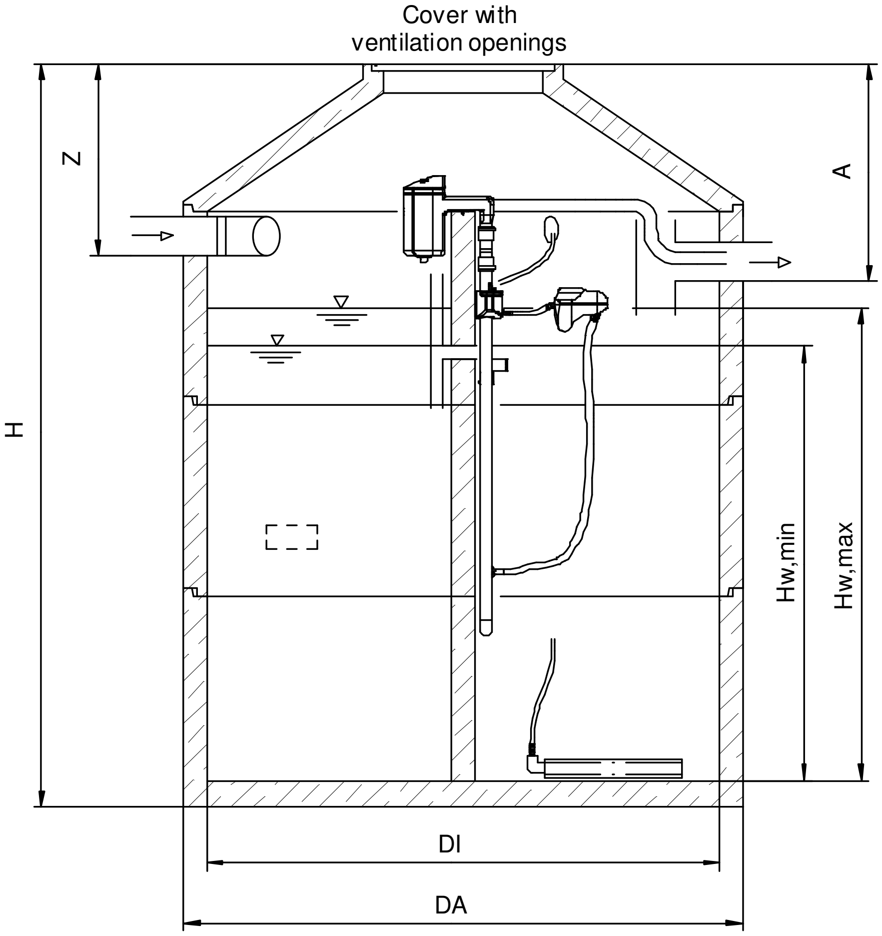


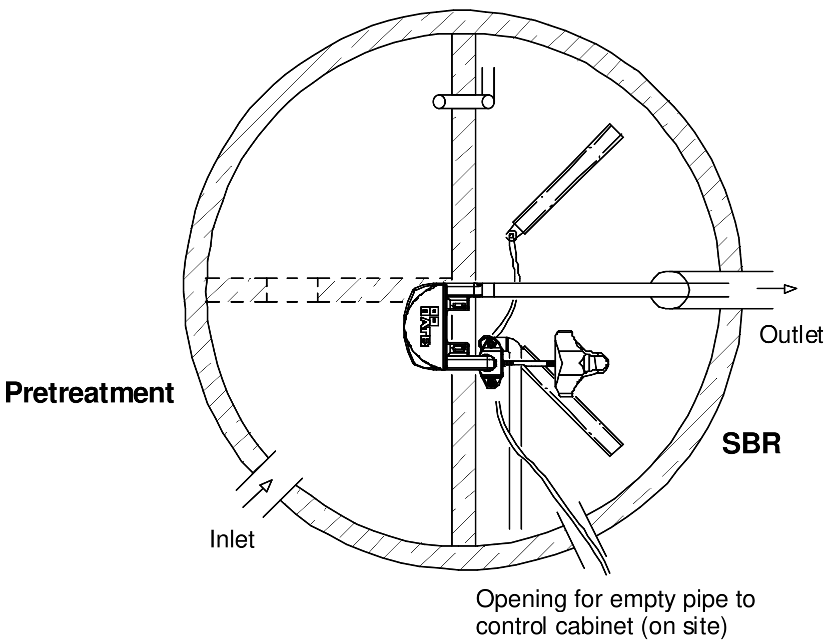
Attention: Important detail!

For plants with enlarged pretreatment (concrete or poly tanks), the water level in the first tank part must be higher than in the last pretreatment chamber and SBR.

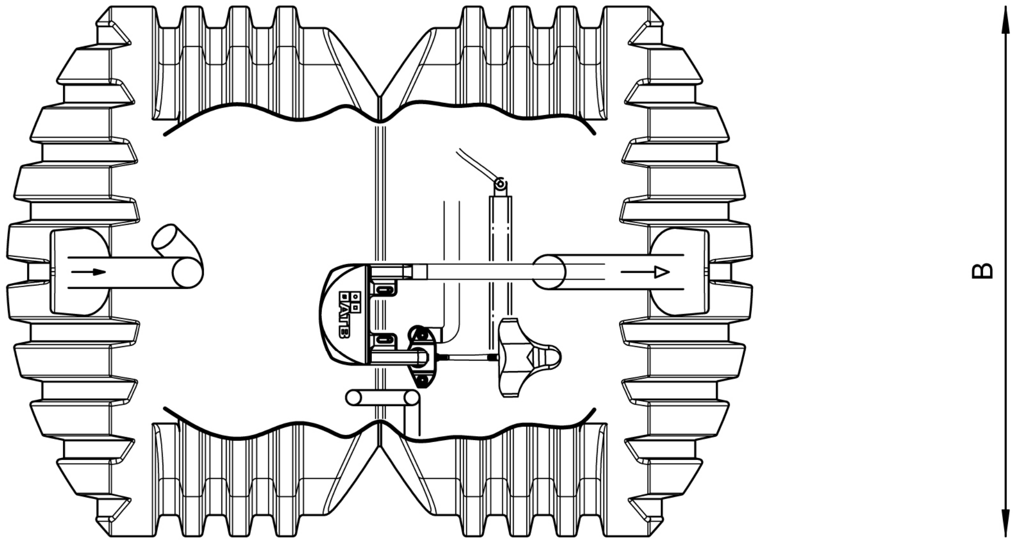
The overflow (opening Ø 100 mm, with floating sludge protection) should be at the level of the treatment plant outlet.

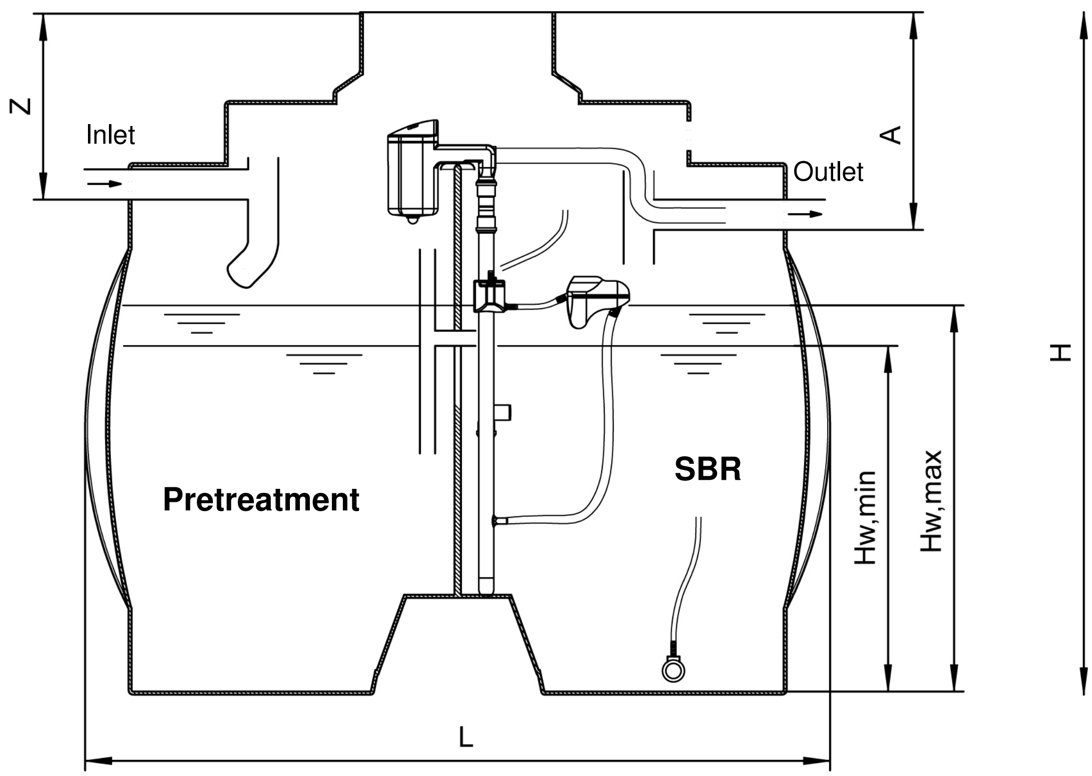
Installation in concrete half-chamber



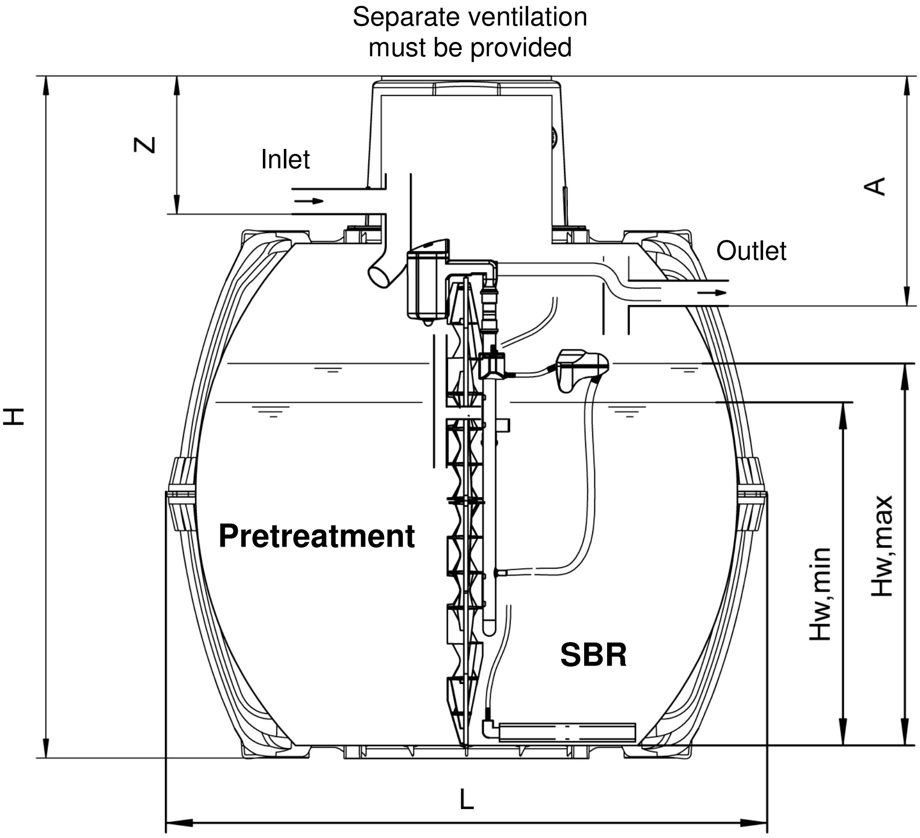


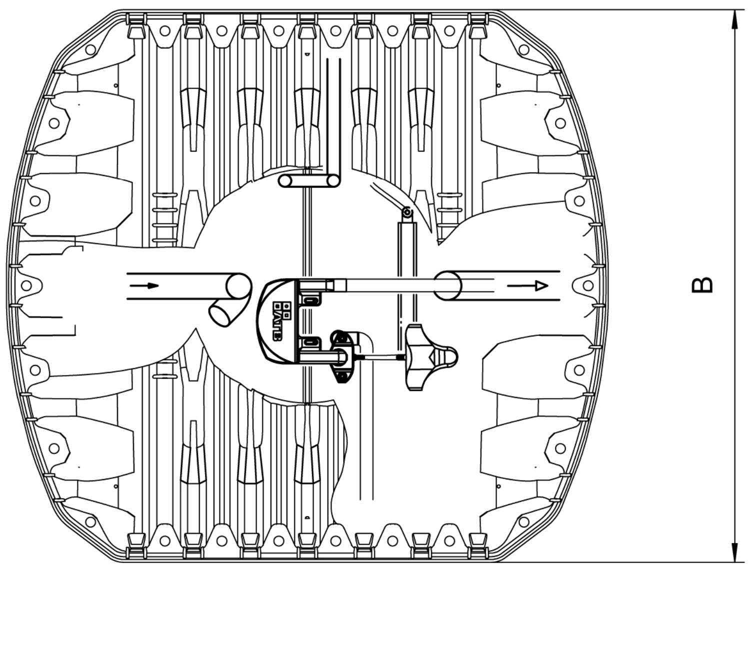
Installation in PE two-chamber tank „Type A“



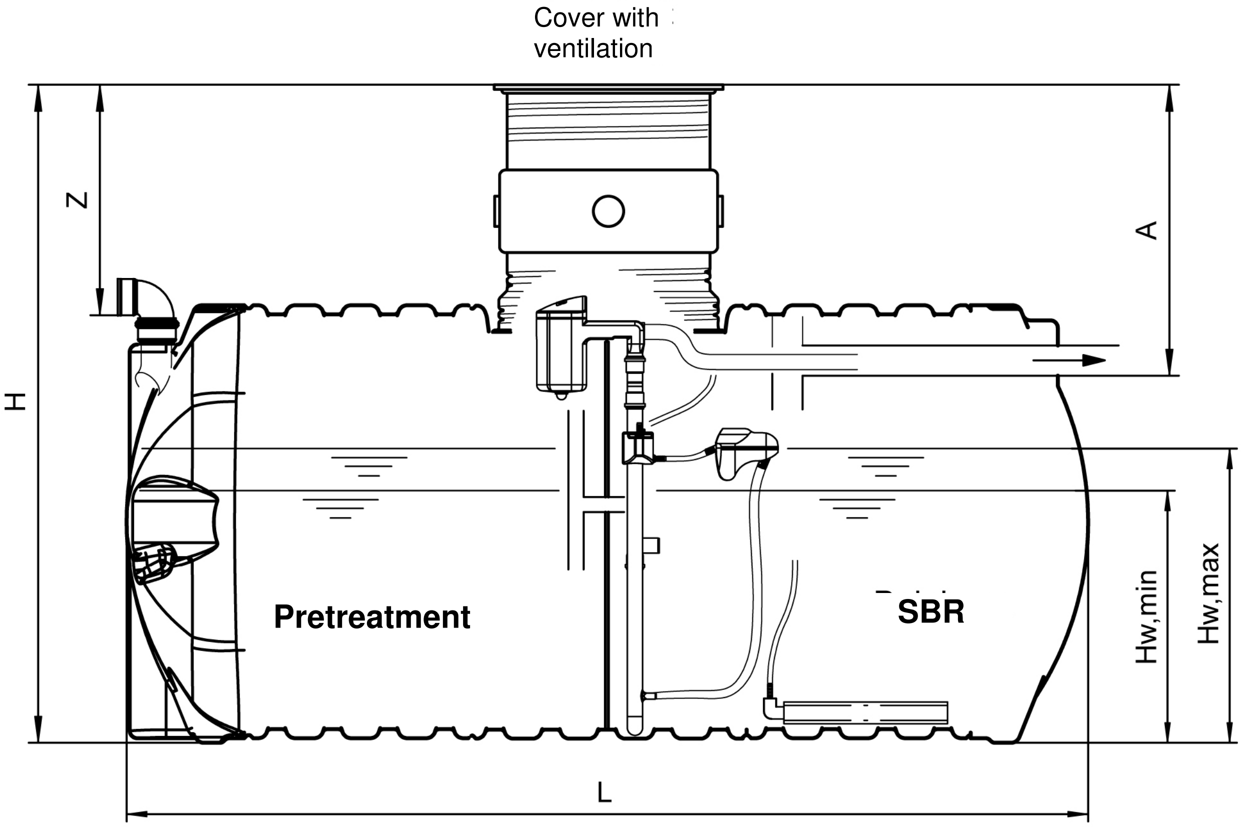


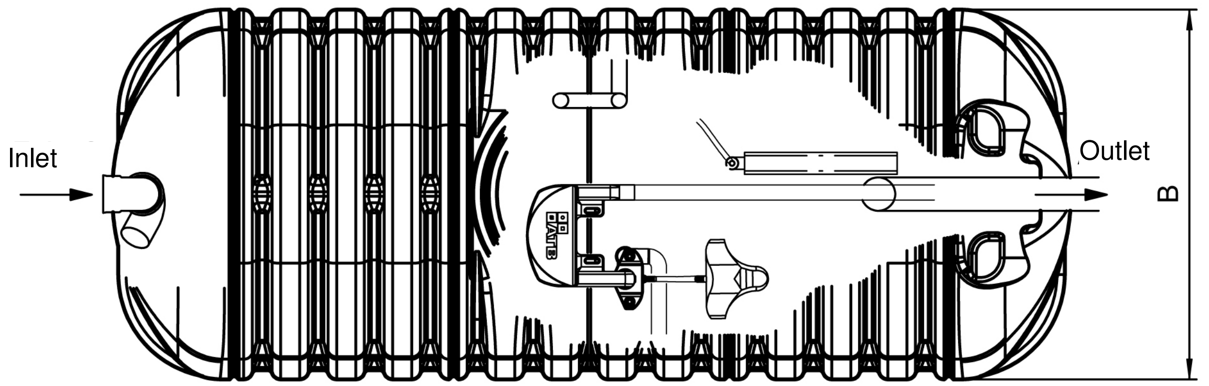
Installation in PP two-chamber tank „Type G“





Installation in PE two-chamber tank „Type 1R T“





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