

- › Installation Manual
- › Operation Manual
- › Maintenance Manual

AQUATO® STABI-KOM SSB® sewage treatment plant



PLEASE NOTE THE FOLLOWING:

The installation manual and the operating diary must be kept directly at the facility, so that both operators and qualified personnel can inspect it at any time.

The current approvals for AQUATO® STABI-KOM can be found on the AQUATO® homepage at:

www.aquato.de/en/download/zulassungen/

Manufacturer

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1 CE marking according to EN 12566-3

EN 12566-3 refers to small wastewater treatment plants prefabricated in the factory or installed on site. The AQUATO® STABI-KOM complete plant is a small wastewater treatment plant prefabricated in the factory which has already passed inspection according to EN 12566-3.

The installation of a retrofit kit comprises a small wastewater treatment plant installed on site. The CE marking must be applied by the person who creates a small wastewater treatment plant on site by assembling the retrofit kit together with the tank.

How do I declare CE conformity according to EN 12566-3 for retrofit kits?

Ensure that the tank has a CE marking according to EN 12566-3.

Ensure that the retrofit kit has a Declaration of Incorporation according to Machinery Directive 2006-42-EC.


Install the retrofit kit according to the installation instructions in Chapter 6.

Declare CE conformity according to EN 12566-3 by adding your company name to the accompanying document.

The purification performance values listed in the accompanying document were determined by a test at a notified body and always refer to the tested plant.

We assume that the retrofit kit is installed in a tank that has passed the test according to EN 12566-3 and complies with the specifications of the attached wastewater calculation.


Your CE sticker
(included with the accessory bag)




Please affix it visibly and permanently on the plant,
e.g. on the controller!



1.1 Accompanying CE document AQUATO® STABI-KOM

	
<p>Distributor:</p>	
<p>12</p>	
<p>EN 12566-3</p>	
<p>Prefabricated small wastewater treatment plant for the treatment of domestic wastewater</p>	
<p>– Reference number of the product:</p>	<p>"ASK"</p>
<p>– Material:</p>	<p>concrete</p>
<p>Efficiency of treatment:</p>	
<p>Efficiency of purification performance (with a certified daily organic pollution load BOD₅ = 0.06 kg/d)</p>	<p>COD: 95.0%</p>
	<p>BOD₅: 99.0%</p>
	<p>SS: 96.0%</p>
	<p>P: NPD</p>
	<p>NH₄: 98.0 %</p>
	<p>N_{tot}: 77.0%</p>
<p>Purification capacity (nominal measurement):</p>	
<p>– Nominal daily organic pollution load (BOD₅)</p>	<p>0.24 kg/d</p>
<p>– Nominal daily inflow (Q_N)</p>	<p>0.60 m³/d</p>
<p>Watertightness: (tested with water)</p>	<p>passed</p>
<p>Stability: (tested in sump)</p>	<p>Depth below ground: 1.23 m WET: 1.19 m</p>
<p>Durability</p>	<p>passed</p>
<p>Fire behaviour</p>	<p>A1</p>
<p>Release of dangerous substances</p>	<p>NPD</p>
<p>Energy consumption</p>	<p>0.67 kWh/d</p>

1.2 Accompanying CE document AQUATO® STABI-KOM for plants according to verified voluntary manufacturer's declaration

	
Distributor:	
12	
EN 12566-3	
Prefabricated small wastewater treatment plant for the treatment of domestic wastewater	
– Reference number of the product:	"ASK"
– Material:	concrete
Efficiency of treatment:	
Efficiency of purification performance (with a certified daily organic pollution load BOD ₅ = 0.06 kg/d)	COD: 92.1 %
	BOD ₅ : 98.3 %
	SS: 92.7 %
	P: NPD
	NH ₄ : 91.0 %
	N _{tot} : 74.3 %
Purification capacity (nominal measurement):	
– Nominal daily organic pollution load (BOD ₅)	0.24 kg/d
– Nominal daily inflow (Q _N)	0.60 m³/d
Watertightness: (tested with water)	passed
Stability: (tested in sump)	Depth below ground:
	1.23 m WET: 1.19 m
Durability	passed
Fire behaviour	A1
Release of dangerous substances	NPD
Energy consumption	0.82 kWh/d

1.3 CE marking AQUATO® STABI-KOM

EC Declaration of Conformity

Manufacturer: Aquato Umwelttechnologien GmbH
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We hereby declare that the product

AQUATO® STABI-KOM for small wastewater treatment plants from 4 to 50 PE

meets the following directives.

89 / 106 / EEC	Construction Products Directive
2006 / 42 / EC	Machinery Directive
2004 / 108 / EEC	EMC Directive
2006 / 95 / EEC	Low-Voltage Directive

The following harmonised standards have been applied:

EN 12566 - 3 (2009)
EN 50081 - 1 (1992)
EN 50082 - 1 (1997)
EN 61000 - 6 - 3 (2001)
EN 61000 - 6 - 1 (2001)
EN 61000 - 3 - 2 (1995)
EN 60204 - 1 (1997)

This letter certifies compliance with the listed directives, but does not include any assurance of characteristics.

The Declaration of Conformity loses its validity if the product is modified without consent.

Herford, 2012



Eckhard Bischoff
Managing Director

2 Important information

Dear Sir or Madam,

We are pleased that you have decided to purchase an AQUATO® STABI-KOM small wastewater treatment plant.

Please read this information in advance to ensure proper operation and compliance with the required discharge values.



The complete manual must be kept directly at the plant so that both the operator and qualified personnel can inspect it at any time.

With the AQUATO® STABI-KOM small wastewater treatment plant, you receive a quality product that reliably cleans your wastewater. The plant is designed for the inflow of domestic wastewater.

The AQUATO® STABI-KOM works according to the SSB® process and meets the DIBt requirements for performance classes C and D. This has been proven in an endurance test conducted by an independent testing institute.

After commissioning, please receive instruction in the plant engineering and functioning of the AQUATO®-STABI-KOM plant.

The regular maintenance of the plant is prescribed by the authorities. Regular maintenance is a requirement for proper operation.

The warranty shall become void if the maintenance intervals are not observed!

2.1 General information

The characteristics of the small wastewater treatment plant verified during testing for the national technical approval can only be achieved during on-site use if the operation and maintenance of the plant are carried out in accordance with the following requirements.



The small wastewater treatment plant must always remain in operation!

The controller of the AQUATO® STABI-KOM indicates faults acoustically and optically. It features a mains-independent power failure monitoring system.

Only wastewater that neither damages the small wastewater treatment plant nor impairs its function may be allowed to flow into the plant. (See DIN 1986-3, Waste Water Ordinance (AbwV) Annex 1 and Chapter 2.3 of this manual.)

All plant components requiring regular maintenance must be freely accessible at all times.

Operation and maintenance must be carried out in such a way that:

- ▶ environmental hazards are not to be expected. This applies in particular to the removal, transport and storage of sludge from the wastewater treatment plant.
- ▶ neither the existence nor the proper functioning of the small wastewater treatment plant are adversely affected.
- ▶ the water intended for discharge is not polluted beyond the permitted level or otherwise sustainably modified.
- ▶ no lasting disturbing odours occur.



Special care must be taken when entering the small wastewater treatment plant for repair or maintenance work!



The relevant accident prevention regulations must be observed!

If you have any problems with your plant, please consult your maintenance company. They will be happy to help you solve any problem you might have.

If the AQUATO small wastewater treatment plant is used for other purposes without the express consent of AQUATO Umwelttechnologien GmbH and/or if the safety instructions are disregarded, this may result in danger or injury to persons and malfunctions or defects in the plant.

In this case, all liability shall be excluded.

Modifications to the plant and unauthorised conversions are not permitted.

Prior to use, the AQUATO small wastewater treatment plant must be installed properly and in accordance with the installation manual.

The **Installation Manual** and the **Controller Operation Manual** must be read carefully before installation and commissioning and the instructions contained therein must be strictly followed!

During assembly and installation, commissioning and operation, as well as, if applicable, decommissioning, the applicable standards and regulations must be observed.

All work may only be carried out by trained specialists with an appropriate certificate of qualification.

The operator of the plant must be instructed in its operation by the fitter.

When connecting the controller, national regulations and the specifications on the nameplate must be observed. The device may only be operated on mains types which contain a protective conductor (PE). Connection to the mains must be made by means of a separate fuse and an RCD fuse. Before commissioning, the electrical protective measures must be checked to verify their proper functioning!

Installation work may only be carried out by qualified electricians.

When working on the device, always pull out the power plug.

Never operate a device that

- ▶ has a malfunction,
- ▶ was dropped,
- ▶ was otherwise damaged or
- ▶ apparently has a damaged connection cable or
- ▶ apparently has a damaged plug.

The plant must be disconnected from the mains supply for all maintenance and repair work.

The technical equipment can simply be removed from the tank.

If it is necessary to enter the plant, this may only be done in the presence of a second person!

In the case of repairs, the proper functioning of the plant and the continued validity of the warranty can only be guaranteed if original spare parts or spare parts approved by AQUATO are used.

Special care is required!

The applicable accident prevention regulations and the accepted rules of technology must be observed!

2.2 Mode of operation of the AQUATO® STABI-KOM

The STABI-KOM small wastewater treatment plant operates according to the SSB® process. The acronym stands for the German sequenzielles schlammstabilisierendes Belebungsverfahren (sequential sludge-stabilizing activation process). The plant employing this process is an aerobic wastewater treatment plant with integrated sludge stabilization.

The STABI-KOM is a single-stage activated sludge plant. The common plant stage is subdivided into at least two chambers. All the chambers of the plant are hydraulically connected, thereby creating a common plant stage. The spatial connection is achieved by connections below the minimum water level between all the chambers, allowing passage through the plant with a free gradient.

Wastewater treatment is essentially achieved by the natural microorganisms that form the activated sludge. The organic compounds contained in the wastewater are broken down by these microorganisms. Optionally, the process of denitrification is additionally implemented. The oxygen supply of the organisms is ensured by intermittent ventilation.

In the SSB process, all wastewater treatment steps take place in the common plant stage, both wastewater treatment using activated sludge on the one hand and sludge separation, stabilization and storage on the other. The differences in decomposition in the individual chambers are only gradual.

The individual operations in the plant are not separated spatially, but rather temporally. For this reason, all the chambers of the plant are temporarily aerated; there is no anaerobic pre-treatment.

The cleaning processes are separated in time by a controller that allows the different phases to be specifically adapted.

The plant is operated fully automatically by a controller (PLC). The individual phases of the wastewater treatment process are worked through sequentially – regulated by the controller.

The wastewater can flow in at any time. It flows freely into the first chamber. Here, initial mixing with the wastewater already in the tank and the initial partial biological purification of the wastewater take place. In addition, the first chamber assumes the function of a coarse material trap. The coarse material is retained here.

At the same time, the partially purified wastewater flows freely from the first chamber into the subsequent chambers. A further partial purification takes place in each subsequent chamber.

In the last chamber, the last partial biological purification of the wastewater takes place. This chamber additionally assumes the function of an intermittently performed secondary sedimentation.

The plant operates in sequencing batch operation, so the treated wastewater is only discharged from the wastewater treatment plant in the clear water discharge phase directly after the settling phase. The clear water is discharged from the upper area of the last chamber. Keeping the connections between the individual chambers / tanks only just below the minimum water level ensures that only treated wastewater is actually conveyed from the plant.

All operations in the plant are performed in regular cycles set at the control device. A treatment cycle consists of the following 4 phases:

1. Aeration phase

In this phase, the pollution load of the wastewater is biologically decomposed by the microorganisms in all chambers. Air is blown into the wastewater through the aeration devices – i.e. membrane diffusers at the bottom of each chamber that are supplied with air from an externally installed compressor via hoses. This provides the microorganisms with the oxygen they need to break down the substances in the wastewater. At the same time, the aeration ensures good mixing in each chamber of the plant. Since the load is highest in the first chamber, a particularly large volume of air is blown in here. All chambers are aerated intermittently. It therefore does not run continuously, but just enough so that the microorganisms receive sufficient oxygen for their metabolic processes and thus for the decomposition of the pollutants. This is economical and saves energy.

2. Settling phase

During the settling phase, the aeration of the water is shut down in all the chambers. Because of the resulting calming effect, the activated sludge settles at the bottom of the tank. Since the sludge sinks completely to the bottom, the purified clear water remains in the upper area of the plant with very good water quality. As this clear water supernatant forms, a separate secondary sedimentation chamber is not required.

3. Clear water discharge phase

As activated sludge flocs and water have separated from each other in the settling phase, the clear, purified water can then be conveyed in the clear water discharge phase from the upper area of the last chamber of the plant to the drain by means of the clear water lifter (or, if necessary, the clear water pump): As the system forms a hydraulic unit, the purified water continues to run from the front chambers. The arrangement of the passage openings in the upper part of the water column ensures that clear wastewater continues to run.

4. Surplus sludge return

During the decomposition of wastewater pollutants, the microorganisms multiply. New activated sludge is continuously generated. In this phase, therefore, the surplus sludge is pumped back from the last chamber to the 1st chamber of the plant by means of a surplus sludge lifter, ensuring that a sufficient clear water phase can form in the last chamber and that a certain degree of circulation also takes place.

After the clear water and surplus sludge removal, the next cycle begins anew with the aeration phase. The plant completes approx. 4 cycles per day.

In normal mode, the water level fluctuates between HW_{min} and HW_{max} in each cycle. During the clear water discharge, water is pumped out until HW_{min} is reached. The water then rises again depending on the inflow to a maximum of HW_{max} .

When operating with float switch and setting the control type to FLOAT, the plant automatically switches to economy mode with reduced ventilation when little water flows in. If enough water flows in

for the float switch to exceed the upper switching point, the plant automatically switches back to normal mode with the cycles described above.

2.3 Harmful substances and their proper disposal

In recent years, liquid detergents have increasingly established themselves in the detergent sector for cleaning garments in washing machines and continue to enjoy increasing popularity. Liquid dishwashing detergents are also seeing increased use in dishwashers. As opposed to powder detergents, liquid detergents additionally contain preservatives to protect against microbial infestation. These preservatives have a strong disinfectant effect which, after the use of the detergent, can also be observed in your small wastewater treatment plant, as they kill the microorganisms required for the biological treatment of the wastewater. The proper functioning of your small wastewater treatment plant can then no longer be guaranteed, leading to an exceedance of the legally required discharge values.

In your own interest, we therefore request that, in addition to the impurities listed in the following table, you also check the liquid detergents, fabric softeners and any other liquid cleaners you use for the presence of such preservatives. Watch out for the following specification: "BENZISOTHIAZOLINONE". Detergents, cleaning agents and fabric softeners with this ingredient should only be used in conjunction with a small wastewater treatment plant in exceptional cases only – but better yet: not at all. Please use powder or tab detergents and cleaners instead and refrain from using fabric softeners, as these are already contained in most heavy-duty detergents.

Only substances whose characteristics correspond to those of domestic wastewater should ever be fed into the plant.

Biocidal, toxic, biologically incompatible and non-biodegradable substances must not enter the plant, as they cause problems in the biological processes.

If you have any questions regarding this problem or your plant, please consult your maintenance company. They will be happy to help you solve any problem you might have.

For other substances that do not belong in the treatment plant, please also refer to the following table.

Substances that do not belong in the sink or the toilet:	What they cause:	Where they belong:
Chemicals	Contaminate the wastewater, lead to decomposition of concrete	Collection points
Paints	Contaminate the wastewater	Collection points
Photo-chemicals	Contaminate the wastewater	Collection points
Disinfectants	Kill bacteria	Do not use!
Medication	Contaminate the wastewater	Collection points, pharmacies
Cotton swabs, panty liners, diapers, adhesive plasters, wet toilet paper	Result in clogging, non-decomposable plastic foils damage water bodies	Waste bin
Plant protection products	Contaminate the wastewater	Collection points
Brush cleaner, thinner	Contaminate the wastewater	Collection points
Cleaning agents, except those that are chlorine-free (environmentally friendly)	Contaminate the wastewater, corrode pipes and seals	Collection points
Pipe cleaners	Corrode pipes and seals, contaminate the wastewater	Collection points
Pesticides, plant protection products	Contaminate the wastewater	Collection points
Cooking oil, frying fat	Leads to deposits and clogged pipes	Collection points
Food waste	Leads to clogging, attracts rats	Waste bin, organic waste
Wallpaper paste	Leads to clogging	Collection points
Textiles (e.g. nylon stockings, cleaning rags, handkerchiefs, etc.)	Clog pipes, may cause pump breakdown	Clothes recycling bin
Bird sand, cat litter	Leads to deposits and clogged pipes	Waste bin
Urinal deodorizers	Contaminate the wastewater	Do not use!
Cement water	Forms deposits, turns into cement	Dispose of with specialist company
Cigarette butts	Deposit in the treatment plant	Waste bin

2.4 Operation of the plant

The small wastewater treatment plant must be operated by the owner or a person commissioned by the owner (operator).

Self-checks:

This inspection work must be carried out by the operator at regular intervals and basically entails checking the function of the plant. Malfunctions must be reported to the maintenance service and eliminated immediately. An operation log must be kept for each small wastewater treatment plant. This is used to enter the results of the self-checks and to list the maintenance reports. Sludge removal times and special incidents should also be recorded in the operation log. On request, the operation log must be submitted to the authorities and the maintenance service.

Daily checks:

Is the plant in operation?

Monthly checks:

- Visual inspection of the effluent for sludge flotation
- Inspection of inlets and outlets for clogging (visual inspection)
- Reading of the operating hours counter of the fan and the pumps. It is not necessary to make a written entry in the operation log when using the AQUATO® STABI-KOM plant, as the controller records the operating hours in an electronic logbook.

Any defects or faults found must be eliminated immediately by the operator or a commissioned specialist and noted in the operation log.

2.5 The operation log

An operation log is included with each AQUATO® STABI-KOM plant. Use this log to enter the results of your checks, the operating hours and special incidents.

2.6 The maintenance service

In order to guarantee long-term smooth operation, the national technical approval of the DIBt prescribes checks to be carried out by the operator and the regular maintenance of the plant.

The plant must be serviced twice a year by a qualified specialist company. You can obtain addresses of maintenance companies from Aquato.

You can read about the exact requirements for operation and maintenance in Chapter 8 and 9 and in the approvals.

3 Product description

3.1 General information

AQUATO® STABI-KOM plants are small wastewater treatment plants for the purification of domestic wastewater. They work according to the SSB® process and meet the requirements specified by the DIBt for performance classes C and D. This has been proven in an endurance test conducted by an independent testing institute.

The plants have been approved by DIBt, Berlin. The corresponding approval numbers and approvals can be found on our website at www.aquato.de. The approvals are also available there as downloads.

An AQUATO® STABI-KOM small wastewater treatment plant consists of:

- one or multiple – generally underground – tanks in which natural microorganisms purify the waste water,
- the ventilation system (compressor, membrane diffusers, air hoses) for supplying the microorganisms with oxygen,
- the lifter system (air-lift pump, air hoses)
- the plug-in control device (PLC), as well as
- the necessary small parts and connection lines and pipes and
- any other design-specific components (e.g. float switch, pumps, electric cables, outdoor cabinet, etc.).

3.2 Intended use

3.2.1 Wastewater discharge

The small wastewater treatment plant was developed for the purification of domestic wastewater. The discharge of other wastewater, e.g. dairy wastewater, is not permitted.

The plant is exclusively intended for the use mentioned above. Any other use, conversion, etc. must be agreed upon in writing with the manufacturer in advance.

If any other use is made without the manufacturer's consent, the manufacturer accepts no liability for any damage that may occur.

3.2.2 Harmful substances

The discharge of biologically harmful substances should be avoided. You can find a list of pollutants and instructions on their proper disposal in Chapter 2.3.

3.3 Tanks

Installation is performed at the factory or on site in adequately dimensioned tanks. The wastewater calculations carried out by Aquato as well as the valid approval form the basis for the installation.

3.4 Scope of supply of the AQUATO® STABI-KOM retrofit kit

3.4.1 AQUATO® STABI-KOM

The AQUATO® STABI-KOM installation kit comprises the following components:

Ventilation, separation and conveying equipment

Controller with bracket

Fastening material and any required further accessories

 <p>Clear water lifter</p>	 <p>Surplus sludge lifter</p>	 <p>Controller and compressor</p>
 <p>Disc diffuser with concrete base</p>	 <p>Fabric hose</p>	

3.4.2 AQUATO® STABI-KOM chained plant

The AQUATO® STABI-KOM chained plant installation set comprises the following components:

Ventilation, separation and conveying equipment

Controller with bracket

Fastening material and any required further accessories



Clear water lifter and
surplus sludge lifter



Controller and compressor



Disc diffuser with concrete base



Fabric hose

3.4.3 AQUATO® STABI-KOM-PAKT

The AQUATO® STABI-KOM-PAKT installation set comprises the following components:

Ventilation, separation and conveying equipment

Controller with bracket

Fastening material and any required further accessories



Partition wall bracket with
clear water lifter and
surplus sludge lifter



Controller and compressor



Disc diffuser with concrete base



Fabric hose

3.4.4 Accessories



Model X7 outdoor cabinet,
colours: grey, granite or green



Model 2.1
outdoor
cabinet



Model 6.1
outdoor cabinet



Wall cabinet
Model 6N

Additional outdoor
cabinets and wall
cabinets available



Additional disc diffuser with concrete base



Float switch with fastener



Model 1 clear water pump, suspension on chain



Model 3 clear water pump, suspension on partition wall bracket



2-way manifold



Reducer for plastic partition walls, approx. 15 mm thick



Flashing light



Sampling unit, optionally for concrete or plastic tank



Coarse material apron



Baffle



Sampling pot, mono



Sampler on partition wall



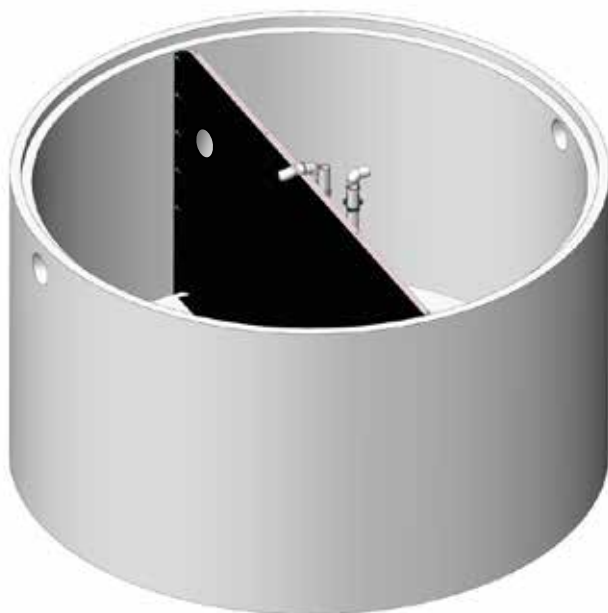
Sampler on partition wall bracket

3.4.5 Partition wall retrofit for 1-chamber concrete tank

The partition wall retrofit for 1-chamber concrete tanks can be used for AQUATO® STABI-KOM plants. The clear water lifter and the excess sludge lifter are attached to the crossbar set. The PE film must receive a passage opening below $H_{W,min}$.

The retrofit comprises the following components:

- PE film as partition wall retrofit
- Crossbar set for suspending the lifters and the PE film
- Fastening material



4 Safety instructions

4.1 General information on the safety information

This installation, operation and maintenance manual contains basic instructions that must be observed during installation, commissioning and maintenance.



The manual must be kept directly at the plant so that both the operator and qualified personnel can inspect it at any time.

The safety instructions contained in this installation manual, the applicable national accident prevention regulations and any internal work, operating and safety regulations must be observed.

Non-observance of the safety instructions may endanger both persons and the environment and result in the loss of any claims for damages.

4.2 Definition of Terms

Operator

The operator of the plant is considered to be the person who ensures that the plant is kept in proper operation.

Qualified personnel

are in a position to assess and perform work assigned to them and to recognize and assess dangers on the basis of the technical training and the knowledge and skills imparted to them.

4.3 Hazard analysis

The AQUATO® STABI-KOM plants were developed according to the state of the art and subjected to a risk analysis. To eliminate or minimize risks, please follow the instructions below.

4.4 Warning symbols used

Below you will find an overview of the symbols used in this manual and their meanings:



Warning of a danger point



Warning of dangerous electrical voltage

4.5 Duty of care of the operator

Make sure that

- the plant is used only in accordance with its intended purpose (see Chapter 3.2 - Intended use),
- the plant is only operated in perfect condition,
- the self-checks are carried out by the operator,
- the maintenance intervals are complied with,
- maintenance and repairs are only carried out by qualified personnel,
- the **Installation, Operation and Maintenance Manual**, the **Controller Operation Manual** and the **operation log** can be inspected at any time,
- and only wear and spare parts approved by the manufacturer are used.

4.6 General safety instructions

The accident prevention regulations for work on wastewater plants (DGUV regulation 22) must be observed. The work should only be carried out by skilled personnel. The following safety instructions must always be observed for your own safety when working and coming into contact with the small wastewater treatment plant:



1. Disconnect the small wastewater treatment plant from the mains!

Special care should be taken when performing maintenance work in the pit. In this case, the plant technology must always be disconnected from the mains and secured against unintentional reconnection of the power supply!



Risk of electric shock in case of defective compressor or defective power cables.



The fine-bubble aeration of the AQUATO® STABI-KOM causes a mixture of water and air bubbles that has a lower density than pure water. This reduces the buoyancy in the water. Should a person accidentally fall into the reactor, he/she would not be able to swim. (**Danger of drowning!**)



2. Ventilate the plant well, access to the pit only with safeguard and supervisor!

Biological processes produce gases that are dangerous to humans. These can lead to fainting and/or death by suffocation, even if they cannot be detected by smell. For this reason, access to the small wastewater treatment plant is only permitted under the supervision of a person keeping watch outdoors and after a good ventilation with appropriate safeguards (gas detector, safety ropes).

Never climb in after unconscious persons, but get help immediately!



3. Electrical fuse protection, RCD fuse!

The AQUATO® STABI-KOM operates with 230 V / 50 Hz alternating voltage. When operating the controller, the personnel must also not be exposed to the risk of electric shock due to carelessness (e.g. wet fingers). The socket provided for the control device must be separately protected by an RCD fuse and connected to the mains supply by electrically qualified personnel. Before commissioning the plant, a qualified electrician must check the proper functioning of the electrical protective measures.

4.7 Safety instructions for qualified personnel

Installation, maintenance and repairs may only be carried out by qualified personnel. Before carrying out the work, it must be ensured that

- the knowledge and skills of the personnel are adequate to the intended use,
- the personnel have received instruction,
- the **Installation, Operation and Maintenance Manual** and the **Controller Operation Manual** have been read and understood.



Before beginning and while carrying out work in the tank, ventilation must be provided to ensure that neither gases in concentrations dangerous to health nor oxygen deficiency or a potentially explosive atmosphere can occur.



Before beginning and while carrying out work, it must be ensured that the plant is disconnected from the mains and secured against being switched on again.



Working in tanks requires protective measures even at low heights. Appropriate measures must therefore be taken against the risk of falling.

If technical measures are not possible, personal protective measures against falling should be taken.



Always wear suitable protective clothing as well as hand, foot and face protection.

Avoid contact with wastewater.

It should be pointed out that, despite all the safety measures taken, residual risks at the installation site cannot be ruled out:

- Danger of slipping and tripping
- Danger due to electrical voltage
- Risk of infection by germs and bacteria
- Danger of explosion

4.8 Rescue measures

Ensure that a second person is always available for protection when working in the tank. Never climb in after an unconscious person, but get help.



Never climb in after an unconscious person, but get help.

5 Transport and storage

5.1 General information on transport

Transport should be carried out in such a way that there is no risk of injury to persons or damage to the plant.

5.2 Dimensions

The dimensions of the complete plants and retrofit kits depend on the PE number and are not listed here individually. If necessary, the dimensions can be viewed at any time in the approvals on the AQUATO® Umwelttechnologien GmbH website at www.aquato.de.

Depending on the system, the plants are delivered in boxes or on a pallet.

5.3 Storage

Ensure that the plant components are stored properly and that no damage can occur.

Avoid:

- Outdoor storage in rain, ice and snow (does not apply to tanks),
- Mechanical effects such as shocks and impacts,
- flying sparks.

5.4 Loading and unloading at the installation site

Ensure that the safety regulations are complied with at the respective installation site.

5.5 Checks

Check the delivery for completeness and possible transport damage. In case of defects, please contact the manufacturer immediately after delivery.

Before installation, the dimensions of the tanks – as they are subject to tolerances – must be checked so that the excavation pit can be adapted if necessary.



Before installation, the **dimensions** of the tanks must be **checked**.

6 Installation

6.1 Before installation

Before installation, check the dimensions of the tanks so that the excavation pit can be adapted if necessary.

6.2 Installation manual for the STABI-KOM tank

The installation instructions of the tank manufacturer of the respective tank must be observed.

The plant may only be set up by qualified personnel. Ensure that the qualified personnel can inspect the **Installation, Operation and Maintenance Manual** and the **Controller Operation Manual** before they begin work.



Make sure that only authorized persons are present at the installation site. When planning and installing the small wastewater treatment plant, the relevant standards and other regulations as well as accident prevention regulations must be observed.



The installation site must be so selected that a waste collection vehicle can drive close enough to the tank that it does not place a load on the tank in the process! Be sure to keep sufficient distance!

6.2.1 Location

The location must be so selected that it is easily accessible for maintenance and especially for sludge removal.

6.2.2 Location relative to buildings

The necessary distance to buildings depends on the design, the depth of the building and the angle of slope of the excavation pit. Exact specifications are contained in DIN 4123.

The tank may not be built on.

6.2.3 Space requirement

Sufficient space must be available for the excavation pit. In addition, the applicable regulations for underground engineering must be observed.

The space required for the excavation pit is calculated from the total length and width or the total diameter of the tank plus a minimum width of 500 mm (DIN 4124) of working space around the tank. In addition, the expansion to the earth's surface resulting from the ground-dependent slope angle (DIN 4124) must be calculated.

6.2.4 Depth of the excavation pit

The depth of the excavation pit depends on the tank height, frost resistance and existing pipes to be taken into account.

6.2.5 Frost resistance

With respect to frost resistance, DIN 1986-100 stipulates an installation depth of at least 800 mm up to the upper edge of the sewage pipe in Central Europe; details regarding any deviations can be obtained from the local authorities.

6.2.6 Ventilation

The tank must be adequately ventilated at all times. Roof ventilation must be provided. If it is not sufficient, a separate vent pipe must be installed. Forced ventilation may also be required.

6.2.7 Additional criteria

Existing lines, pipes and other special features must be taken into account in such a way that impairments and hazards are prevented (DIN 18300).

6.2.8 Tank installation

In addition to the following general installation instructions, the special installation instructions of the manufacturer of the respective tank(s) must also be complied with.

The tank(s) must be installed at the correct height and must be watertight. A leak test must have been carried out and successfully completed.

All chambers of the plant must be accessible to persons. The diameter of the access opening must be at least 60 cm.

The tank must be adequately ventilated at all times. Roof ventilation must be provided. If it is not sufficient, a separate vent pipe must be installed. Forced ventilation may also be required.

The base area of the excavation pit must extend at least 500 mm beyond the tank dimensions on each side. The distance between the tanks must also be at least 500 mm.



The relevant accident prevention regulations, guidelines, safety rules and leaflets of the responsible employers' liability insurance association (DGUV), as well as the regulations of the Association of German Electrical Engineers (VDE) must be observed when constructing and operating wastewater treatment plants.



The installation instructions of the manufacturer of the respective tank must be observed.

6.2.9 Connection of the inlet and outlet pipes, sampling

The laying of the inlet and outlet as well as the connecting pipes between the tanks (KG pipe, DN 100/150) is carried out according to "DIN 1986 Drainage systems for buildings and properties" and "DIN 4033 Guideline for the construction of drainage channels and pipes".

Use a PVC KG pipe with DN 150 (required with PE 27 and higher, DIN EN 13566-3) or DN 100 (permissible up to max. 26 PE) for the inlet and outlet pipes.

Integrate the inlet pipe into the prepared bore hole. Connect the outlet pipe as well.

If an (optional) sampling unit with sampling beaker is installed, first insert the sampler from the inside of the tank onto the drain pipe and connect the clear water lifter to the connection on the sampler.

When using an (optional) sampler for partition wall attachment, attach it to the partition wall. In a STABI-KOM-PAKT plant, the sampler is situated on the partition wall bracket. Connect the clear water lifter to the connection on the sampler.

Ensure that both the inlet and outlet pipes are laid with a corresponding gradient of at least 1% in the direction of flow. Possible later settlements must be taken into account.

According to DIN 4261 Part 1, the inlet to the primary sedimentation should extend about 10 cm beyond the inner wall of the tank.

6.2.10 Empty conduit between the control cabinet and tank

Install a PVC KG empty conduit with DN 100 to DN 150 as the connection between the control console / control cabinet / outdoor cabinet and the tank. The empty conduit does not have to be laid frost-free. It should be installed with a slight gradient to the tank so that any condensation water that may form can drain. The empty technology conduit must be connected to an opening above the maximum water level.

The empty conduit can be integrated on the side of the control cabinet location via a DN 100 to DN 150 bore. It is recommended to foam the remaining openings in the masonry with PU foam after the air hoses and the cable have been fed through.

In each case, fit the empty conduit with a pull wire or rope to allow the later installation of the air hoses and float cable.

Please lay the empty conduits in as straight as possible a line to the tank. Every bend and kink in the hose increases the pressure resistance in the air supply lines, thereby reducing the performance of the plant. Required bends must be formed with no more than 30° fittings – better with 15° fittings. For this reason, use three 15° bends (or one 30° bend and one 15° bend) instead of 45° bends, for example. Please avoid using 90° bends in general.



The installation instructions of the manufacturer of the respective tank must be observed.

6.3 Control cabinet and controller

6.3.1 Setting up the outdoor cabinet

Set up the outdoor column in a shady and wind-protected location. In climatically unfavourable locations, it is sensible and advisable to install a fan for cooling and/or a control cabinet heater for heating, controlled by a thermostat. This also applies if an external wall cabinet is fitted.

If you place the control technology in an outdoor cabinet, the cabinet needs a stable anchoring. The supplied plinth is used for this purpose. Bury the plinth up to the marker as shown in Figure 1.

To minimize the formation of condensation, use plinth filler wherever possible. When installing the plinth in the ground, take the routing of the air hoses, the power cable and the float switch cable into account.

The **empty conduit** must be **sealed** after the hoses and any cables have been fed through, otherwise unwanted gases and moisture may enter the outdoor cabinet and cause damage.

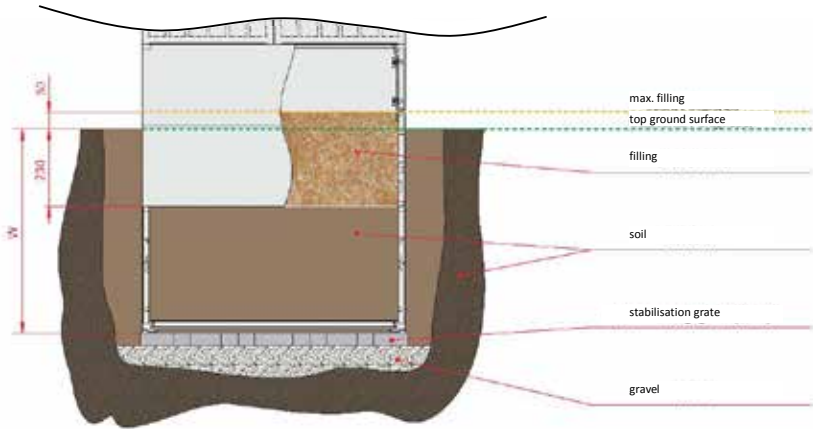


Figure 1: Setting up the outdoor cabinet

6.3.2 Connecting the controller

A 230 V / 50 Hz power supply line must be laid on site to the location of the controller and separately protected with a B 16 A slow-blow fuse and a 25 A / 30 mA RCD fuse.

The K-Pilot 18.1/18.3/18.4 controller is delivered bolted to a bracket for mounting on a house wall.

Depending on the model, it is mounted in an outdoor cabinet or a wall cabinet with or without a bracket on the rear wall by means of a mounting plate, a mounting rail or directly.

If the controller has to be opened, disconnect the plant from the mains before opening the controller. To prevent tearing or damaging cables or hoses, open the control unit carefully and do not simply drop the cover.

If the compressor is not placed above the controller and thus the hose connection on the controller is turned in another direction, make sure that the hose inside the controller is not twisted.

6.4 Installation manual for the AQUATO® STABI-KOM retrofit kit

The plant may only be set up by qualified personnel. Ensure that the qualified personnel can inspect the **Installation, Operation and Maintenance Manual** and the **Controller Operation Manual** before they begin work.



Make sure that only authorized persons are present at the installation site.
Observe the safety instructions and the regulations at the installation site.

6.4.1 Environment

The requirements for the structure are regulated within Germany according to DIN 4261.

For plants installed outside Germany, the regulations of the respective country and individual design apply.

The volumes and minimum installation heights are determined by the manufacturer on the basis of a wastewater calculation.

6.4.2 Preparatory work

Before starting installation, observe the safety instructions listed in the **Installation, Operation and Maintenance Manual** and the **Controller Operation Manual** and secure the installation site.

- All dimensions must be checked on the construction site.
- All chambers of the plant must be accessible to persons (opening at least 60 cm).
- Ensure that the watertightness, durability and stability of the structure is guaranteed.
- Empty and clean the septic tank before starting work.
- Ensure sufficient ventilation in the septic tank. The tank must be adequately ventilated at all times.
- The inlet must run to the first chamber.
- **All chambers must be connected to each other below the water level $H_{W,min}$.**
- The outlet pipe is connected to the tank and extends about 15 cm into the tank (do not cut off at the shaft wall).
- Install a PVC KG empty conduit with DN 100 to DN 150 as the connection between the controller (control console / control cabinet / outdoor cabinet) and the tank. The empty conduit does not have to be laid frost-free. It should be installed with a slight **gradient** to the tank so that any condensation water that may form can drain.
- Please lay the empty conduits in as straight as possible a line to the tank. Every bend and kink in the hose increases the pressure resistance in the air supply lines, thereby reducing the performance of the plant.
Please avoid using 90° bends in general. Required bends must be formed with no more than 30° fittings. It is best not to use bends > 15°.

- If your plant is subdivided into several individual pits, an additional DN 100 empty conduit for the return sludge line must be laid by the shortest route with a slight **gradient** from the last tank to the first tank if the existing connection cannot be used for this purpose.
- In each case, fit the empty conduit(s) from the controller to the pit with a pull wire or rope to allow the later installation of the air hoses and optional float cable.
- The empty conduit can be integrated on the side of the control cabinet location via a DN 100 to DN 150 bore. It is recommended to foam the remaining openings in the masonry, e.g. with PU foam, after the air hoses and the cable have been fed through in order to prevent the penetration of odours or fumes.
- The maximum hose length between the controller and the small wastewater treatment plant must not exceed 10 m.
- Make sure a power connection (230 V) is available and that it is separately fused as follows: B 16 A slow-blow fuse and 25 A / 30 mA RCD fuse.



Ensure that all chambers are connected to each other below the water level $H_{W,min}$.

6.4.3 Attachment of coarse material separator and baffle

If you have decided on a plant with a coarse material separator and a baffle (both optional), then these are installed on the partition wall between the coarse material storage / sludge storage / activation chamber and the activation / secondary sedimentation chamber (always in the transition to the last chamber).



Coarse material apron

The partition wall between the front chamber(s) (with coarse material storage, sludge storage and activation) and the last chamber (with activation and secondary sedimentation) retains the existing passage opening. To avoid the passage of coarse material or floating sludge, the supplied coarse material separator and the included baffle are attached to the partition wall.

The coarse material apron is installed with the supplied material in front of the passage opening to activation / secondary sedimentation (on the side of the second-to-last sludge storage / activation chamber) so that the opening is completely covered and the apron ends above the highest water level. Ideally, the opening should be in the middle behind the apron. If two openings are present, either both must be behind the apron or one of them must be closed.

In pits with overflows, the coarse material separator is installed so that the overflow disappears behind it.



Baffle

The baffle is installed on the other side (on the side of the last chamber with activation / secondary sedimentation) in front of the opening with the supplied fastening material. Here too, the baffle ends above the highest water level.

6.4.4 "ATTENTION: Sludge removal here" sign



Sludge removal sign

When sludge is removed as required, all chambers except the last one are emptied (see Chapter 9).

In order to avoid confusion in 1-tank systems with multiple chambers, an information sign is included with the delivery.

Place this on the partition wall so that the arrow marks the chambers from which there is **no clear water discharge**.



Attention! In **each** chamber, there is at least one **membrane diffuser**, which must **not be damaged** when disposing the sludge.

6.4.5 Procedure for lifter installation

Before starting installation, observe the safety instructions listed in the **Installation, Operation and Maintenance Manual** and the **Controller Operation Manual** and secure the installation site.

Depending on the planned number of inhabitants, refer to the "national technical approval" or a separate wastewater treatment calculation for your special tank for the required minimum **water height** $H_{W,min}$ in the STABI-KOM plant.

Ensure that all chambers are connected to each other below the water level $H_{W,min}$.

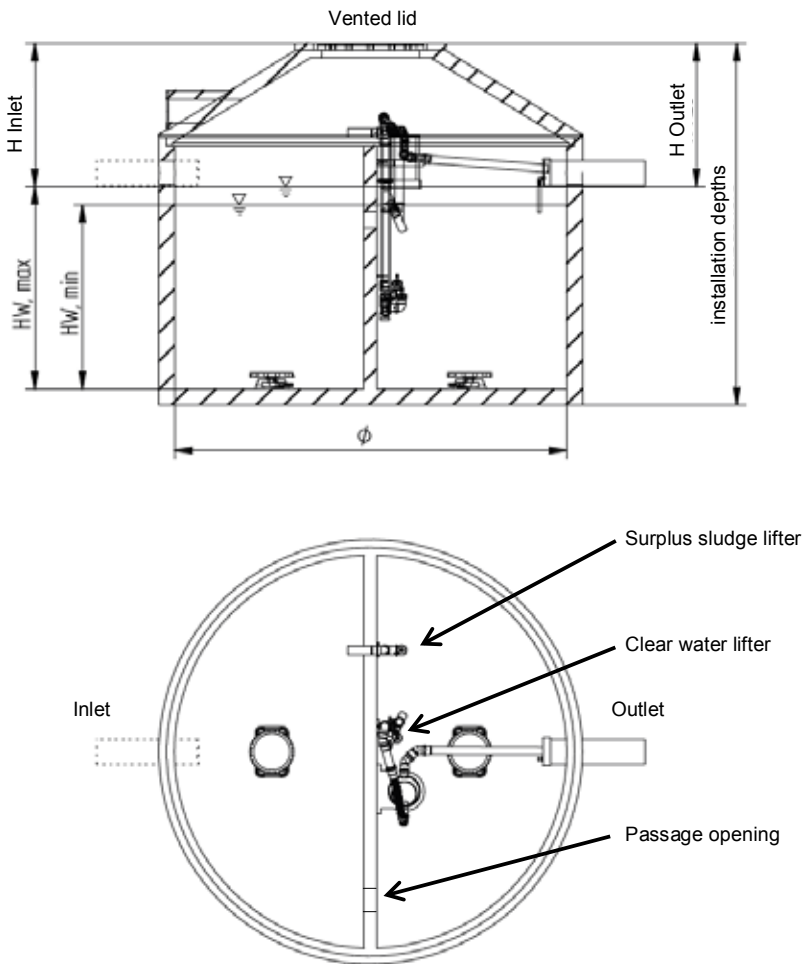


Figure 2: Installation of technology in a two-chamber concrete pit

6.4.5.1 AQUATO® STABI-KOM wall mounting

Please note: For partition walls with a plastic design, special installation accessories are required that are not automatically included in the scope of delivery, but must be ordered separately.

The clear water and the surplus sludge lifter are fastened separately to the wall in the last chamber (= activation / secondary sedimentation) using PP pipe clamps and stainless-steel nail plugs.

The clear water lifter must be adjusted according to $H_{w,min}$ (mark on the lifter = distance from the ground). The outlet connector of the clear water lifter is guided with a free gradient into the outlet or into the (optional) sampler.

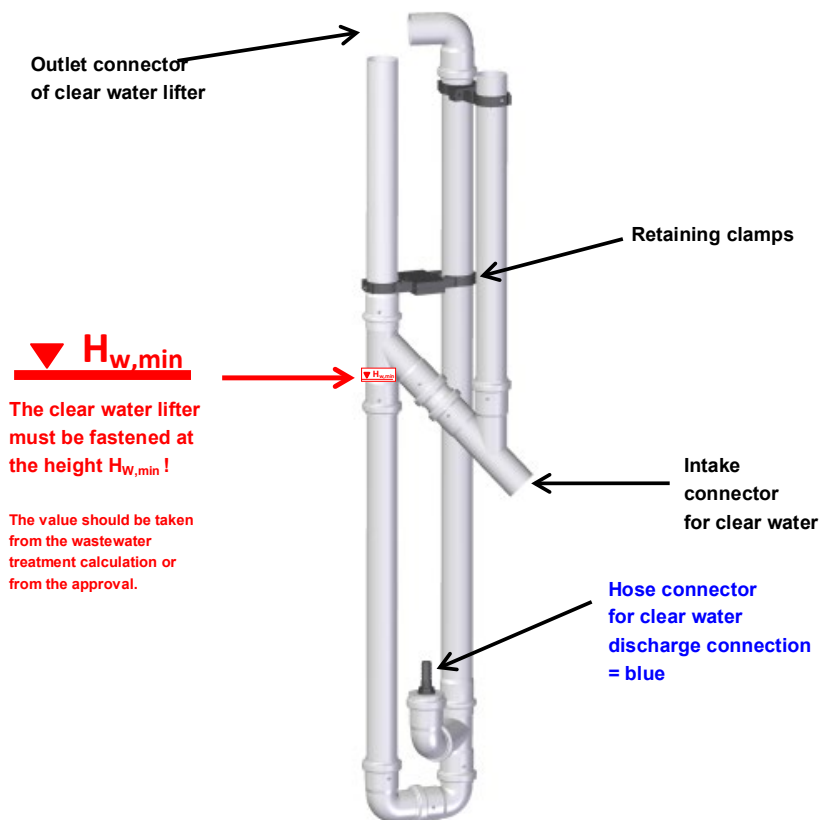


Figure 3: Clear water lifter

The outlet of the surplus sludge lifter should be installed at the same height as that of the clear water lifter.

In 1-tank systems, the outlet connector of the surplus sludge lifter only has to extend over the partition wall into the first chamber.

In 2-tank systems, the 30 mm hose is connected to the hose connection of the surplus sludge lifter. The hose is led back to the first chamber of the first tank.

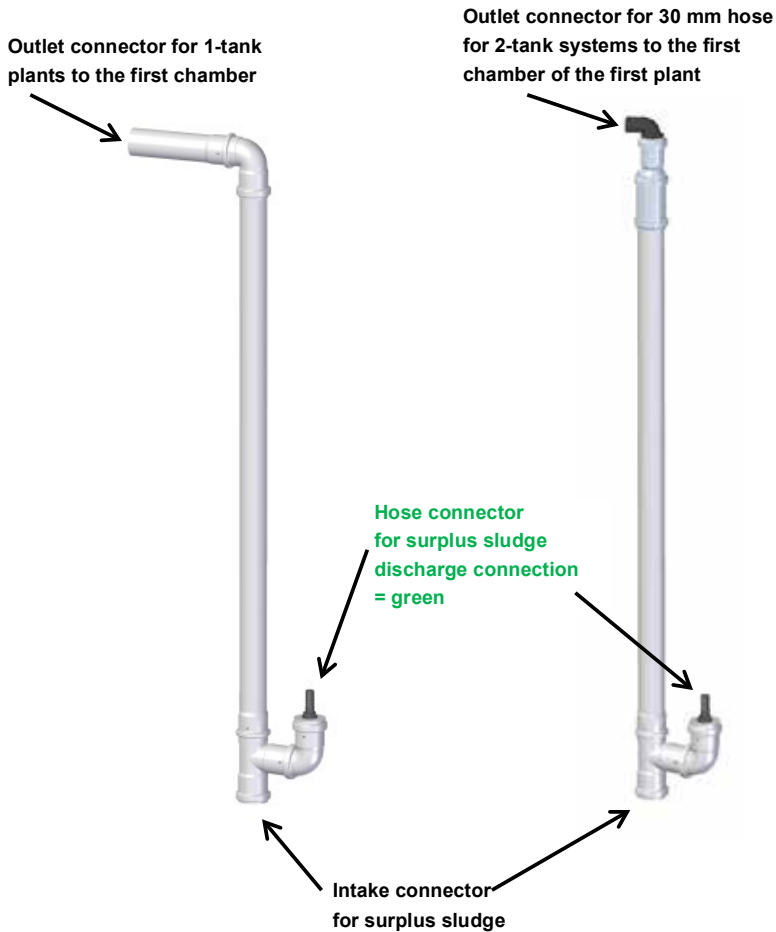


Figure 4: Surplus sludge lifter

6.4.5.2 AQUATO® STABI-KOM chained plant

The surplus sludge lifter and the clear water lifter are fastened to a PE supporting tube with clamps. The PE supporting tube has a stainless-steel retaining bracket at the top that can be suspended with 2 shackles and 2 chains (each 1.5 m long). At the lower end, there is a concrete weight to keep the unit upright.

The installation height is adjusted via the chain length. The clear water lifter must be adjusted according to $H_{w,min}$ (mark on the lifter = distance from the ground).

The outlet connector of the clear water lifter is guided with a free gradient into the outlet or into the (optional) sampler.

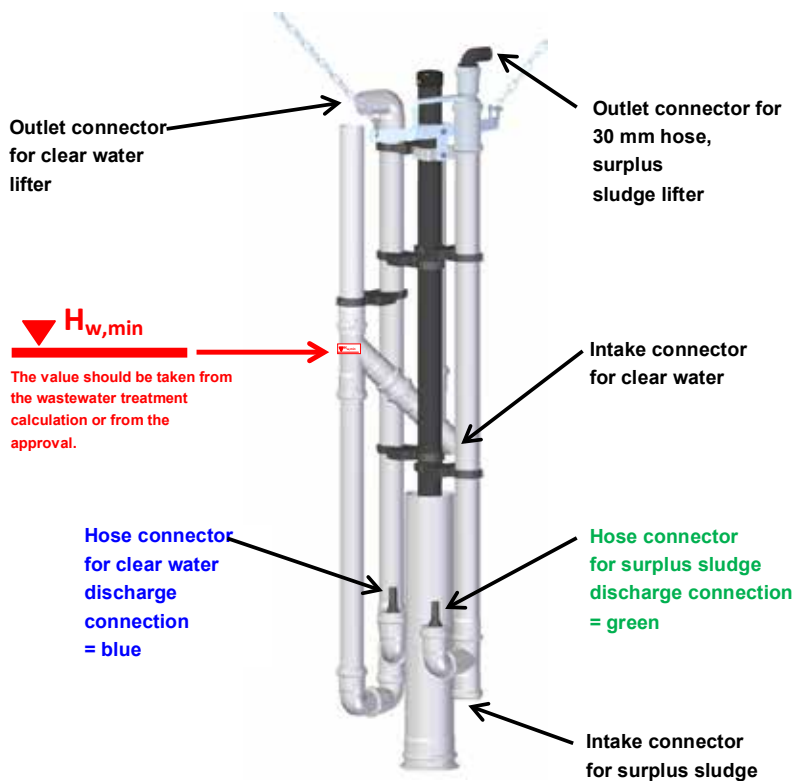


Figure 5: Chain-suspended clear water and surplus sludge lifters

6.4.5.3 AQUATO® STABI-KOM-PAKT

The surplus sludge lifter and the clear water lifter form a unit by means of a polyethylene partition wall bracket. This unit is suspended as a whole on the partition wall in such a way that the lifters are located in the last chamber. The partition wall bracket has 2 contact surfaces: one for a partition wall with a wall thickness of up to 75 mm and one for a partition wall with a wall thickness of up to 125 mm. For plastic partition walls, the reducer (see Chapter 3.4.4) is screwed to the bracket.

The lifters are mounted to a holder. Height adjustments can be made by loosening the clamps.

The clear water lifter must be adjusted according to $H_{w,min}$ (mark on the lifter = distance from the ground). The outlet connector of the clear water lifter is guided with a free gradient into the outlet or into the (optional) sampler. Alternatively, the sampler (see Chapter 3.4.4) can be provided for sampling, which is then placed on the partition wall bracket during installation.

The outlet connector of the surplus sludge lifter only has to extend over the partition wall into the first chamber.

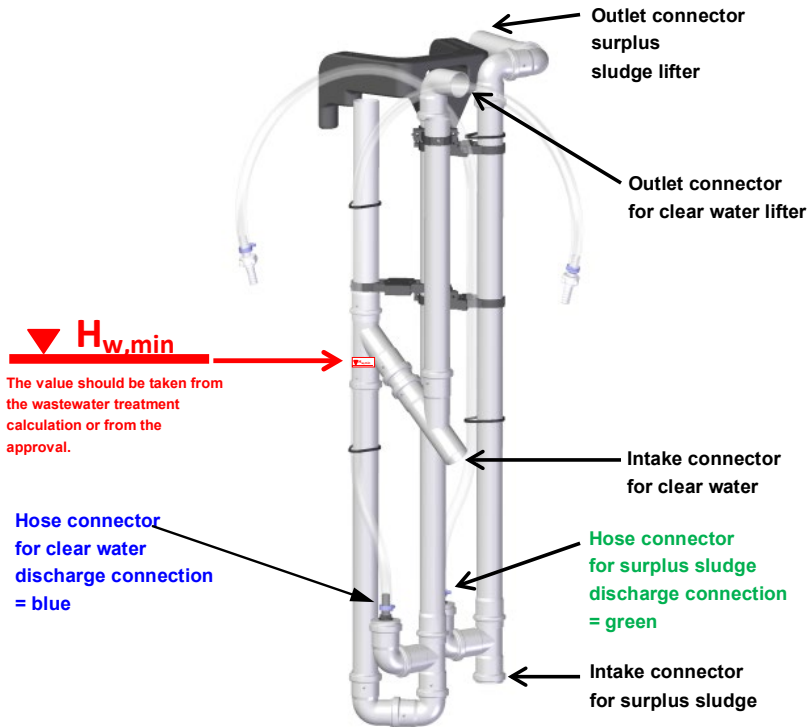


Figure 6: Clear water lifter and surplus sludge lifter as a unit

6.4.5.4 Special case: Deviating delivery heads

The standard lift height (delivery head) of our STABI-KOM plant for clear water discharge is max. 50 cm, which roughly corresponds to the distance $H_{W,min}$ to the pit outlet.

If the delivery head has to be increased, e.g. by 35 cm, then **all** HT pipes must be extended by 35 cm on site **above** and **below** the $H_{W,min}$ marks. The injection point (= hose connection) must be installed as much lower as the delivery head is increased.

If the delivery head becomes too high, the use of a clear water pump is recommended. If the extension below $H_{W,min}$ is not possible with the length required above the water level, the use of a clear water pump is indispensable.



ATTENTION: Verify whether the $H_{W,min}$ measurement agrees with the manufacturer specifications. In case of deviations, the heights of the lifters must be changed.

6.4.6 Possible installation variants

6.4.6.1 Installation in 1-tank system

The following will explain the necessary preparations for the concrete tank using the example of a **2-chamber pit with two half-chambers**.

These instructions should be applied accordingly to other tank configurations.

**½ chamber for coarse material separation / sludge storage / activation,
½ chamber for activation / secondary sedimentation**

- All chambers are connected to each other below the water level.
- Position the sludge and clear water lifters in the activation / secondary sedimentation half-chamber.
- Position the coarse material separator (optional) in the coarse material storage / sludge storage / activation half-chamber in front of the passage to the activation / secondary sedimentation half-chamber.
- Install the baffle (optional) behind the passage in the activation / secondary sedimentation half-chamber.
- The outlet connector of the sludge lifter has to extend into the first chamber.
- The outlet connector of the clear water lifter is guided with a free gradient into the outlet or (optionally) connected to the sampler.
- In each chamber, (at least) one membrane diffuser is installed.

**2 x ¼ chamber for coarse material separation / sludge storage / activation,
½ chamber for activation / secondary sedimentation.**

As above...

**½ and ¼ chamber for coarse material separation / sludge storage / activation,
¼ chamber for activation / secondary sedimentation.**

As above...

6.4.6.2 Installation in 2-tank system

1st tank for coarse material separation / sludge storage / activation,

2nd tank for activation / secondary sedimentation.

- All tanks are connected to each other below the water level.
- Position the sludge and clear water lifters in the activation / secondary sedimentation half-chamber.
- Position the coarse material separator (optional) in the coarse material storage / sludge storage / activation half-chamber in front of the passage to the activation / secondary sedimentation half-chamber.
- Install the baffle (optional) behind the passage in the activation / secondary sedimentation.
- The surplus sludge lifter must convey to the first chamber.
- The outlet connector of the clear water lifter is guided with a free gradient into the outlet or (optionally) connected to the sampler.
- In each tank, (at least) one membrane diffuser is installed.

1st tank (divided) for coarse material separation / sludge storage / activation,

2nd tank for activation / secondary sedimentation.

As above...

6.4.6.3 Installation in 3-tank system

1st tank (divided) for coarse material separation / sludge storage / activation,

2nd tank for sludge storage / activation,

3rd tank for activation / secondary sedimentation.

As above...

6.4.6.4 Tanks without partition wall

The STABI-KOM chained plant (see Chapter 6.4.5.2) is preferably used in tanks without a partition wall. The sludge lifter and the clear water lifter are fastened to a PE supporting tube with a retaining bracket on chains. The installation height is adjusted via the chain length.

ATTENTION: Verify whether the $H_{W,min}$ measurement agrees with the manufacturer specifications. In case of deviations, the heights of the lifters must be changed.

6.4.7 Diffuser

Carefully place the membrane diffuser(s) with the concrete base in the middle of each chamber of the tank(s). Make sure that the **membrane diffusers are always at the same height**.



Figure 7: Membrane diffuser for aeration

6.4.8 Adjusting the air hoses

As a standard, the hose is supplied in the form of a roll. The roll must be unrolled similarly to a fire hose.

In a two-chamber system, for example, you divide the hose roll into four equally long parts. Then connect one end of each to one of the two membrane diffusers or the lifters and fasten them with hose clamps. Mark the two ends of the hoses, e.g. with coloured adhesive tape.

Blue	clear water discharge
Green	return sludge line
Black	aeration of last chamber(s)
Red	aeration of first chamber(s)

In a three-chamber system, you divide the roll into 5 pieces of equal length, then divide one of the pieces into two pieces of equal length (!) to connect the aeration pipe of the last chamber (black) with the two membrane diffusers using the supplied connecting material: Air distributor with shut-off valves and hose clamps.

6.4.9 Air hoses and cables

Attach the previously cut hoses to the corresponding hose connections of the membrane diffusers (red and black), to the clear water discharge (blue) and to the return sludge line (green) using the supplied hose clamps.

Bundle the air hoses and any required cables, e.g. the float switch cable if the system is equipped with an (optional) float switch. Pull them together by means of a pull wire in the direction of the control cabinet through the empty conduit laid on site. There, fasten the connections to the corresponding outputs of the controller using hose clamps. Place the (optional) cable(s) on the corresponding connections.

6.4.10 Laying and fitting the hoses

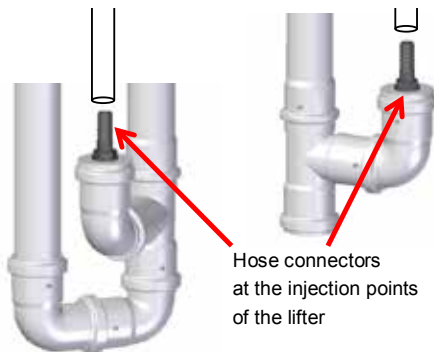
Installation steps:

- Cut the hoses for the lifters (must be led to the controller) and the hoses for the membrane diffusers (must be led to the membrane diffusers via the supplied hose connectors).
- If necessary, mark both ends with colour strips with the same colour.
- Temporarily close the hose ends (keep them clean inside) and simultaneously pull all hoses (with the float switch cable, if present) from the tank to the controller through the empty conduit.



Attention: If the empty conduit ends in an outdoor cabinet, it must be ensured that no fumes/gases enter the cabinet through the empty conduit during operation. Otherwise, the controller may be damaged.

- Connect the hose ends to the controller according to their colour markings and fasten them with hose clamps.
- At the other end, connect accordingly to the lifters and to the membrane diffuser(s) or, if applicable, to the distributor to the membrane diffusers and fasten with hose clamps.
- If 2 membrane diffusers are used, these are connected with an air distributor and 2 short hose pieces. In the case of several aeration devices, corresponding distributors are included in the delivery.
- Make sure that the **membrane diffusers are always at the same height** and that the hose connections for distribution always have the same length.



Hoses routed upwards on the lifters

Figure 8: Fastening of the hoses on the lifter and laying in the tank

6.4.11 Connections to the controller

The hose connections are named on the front of the controller with colour coding (STABI-KOM: see graphics, bottom row: SSB®).

Aeration of last chamber(s) (rear) = black ❶

Sludge discharge (right) = green ❷

Aeration of first chamber(s) (front) = red ❸

Clear water discharge (left) = blue ❹

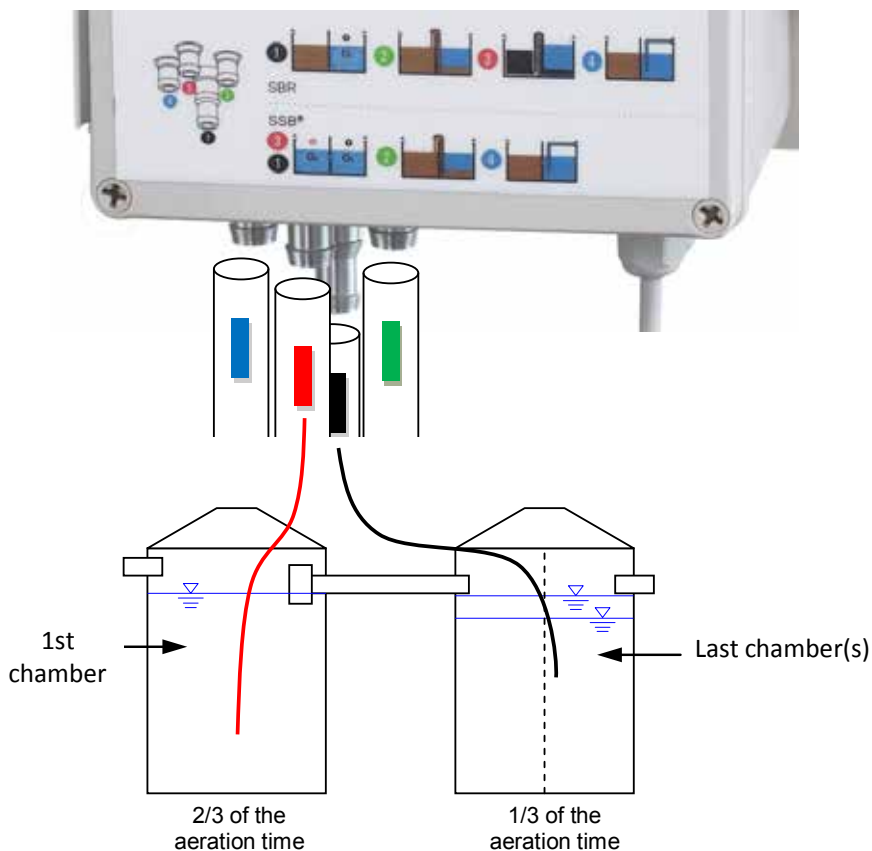


Figure 9: Hose connections to the controller

6.4.12 Setting the aeration

With the SSB plant, all chambers of the plant are aerated. The first chamber must receive the largest portion of the injected air (approx. 2/3), the remaining air (approx. 1/3) enters the rear chamber(s). All chambers of the plant are connected to each other below the minimum water level $H_{W \min}$.

6.4.12.1 Special aeration control

The special aeration control is used if the "1st CHAMBER" aeration option is **not** selected when the controller is put into operation (or under Select plant types in the Service menu) (see **Controller Operation Manual**).

With this setting, aeration is only provided via one output: output 1 (rear, black). The air distribution must be regulated accordingly with distributors (e.g. Y-pieces) and shut-off valves so that approx. 2/3 of the aeration takes place in the first chamber and approx. 1/3 in the last chamber(s).

This type of aeration (special control) is only possible if all chambers of the plant are connected below the minimum water level $H_{W \min}$, as otherwise aeration cannot be securely provided in all chambers (see Figure 10 to Figure 14).

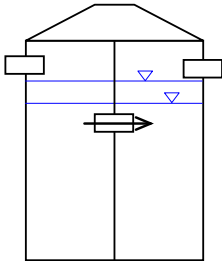


Figure 10: 2-chamber pit (1 tank) with underwater connection

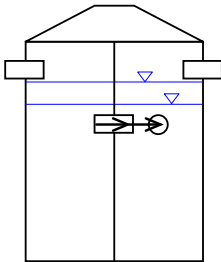


Figure 11: 3-chamber pit (1 tank) with underwater connection

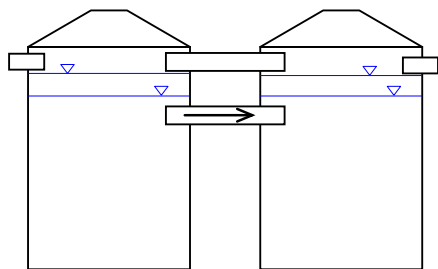


Figure 12: 2-tank system with underwater connection

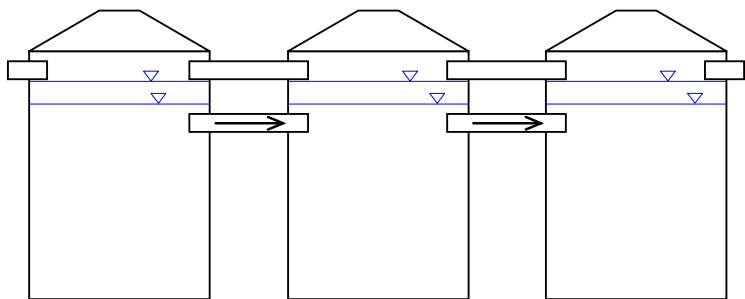


Figure 13: 3-tank system with underwater connection

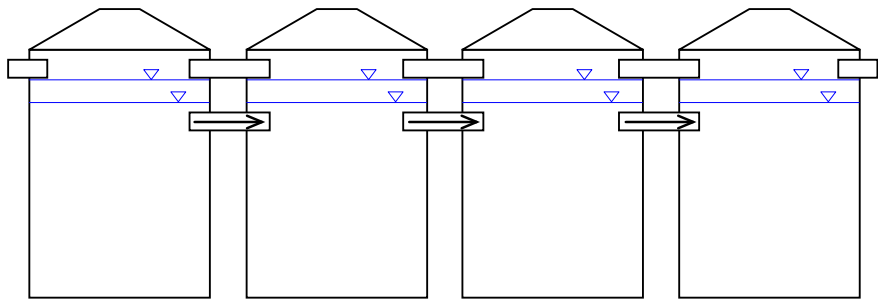


Figure 14: 4-tank system with underwater connection

6.4.12.2 Standard aeration control

Normally, the standard aeration control is applied by selecting the "1st CHAMBER" aeration option when the controller is put into operation (or under Select plant types in the Service menu) (see **Controller Operation Manual**). With this setting, the front red output marked 3 is used to aerate the first chamber(s). The front black output marked 1 is used to aerate the last chamber(s).

The controller is set so that first the first chamber(s) is/are aerated via the front output 3 (display: "Aeration 1st C") and then the last chamber(s) via the rear aeration output 1 (display: "+Aeration").

As a standard in SSB plants, all chambers of the plant are connected together below the minimum water level $H_{W \min}$ (see Figure 10 to Figure 14). The standard aeration control with 2 outputs also makes it possible to aerate the first tank(s) if they are only connected to the other tanks in the overflow (i.e. without underwater connection) and if there is sufficient buffer volume in the last tank(s) (see Figure 15 to Figure 18).

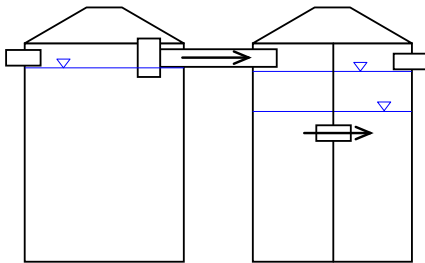


Figure 15: 2-tank system without underwater connection

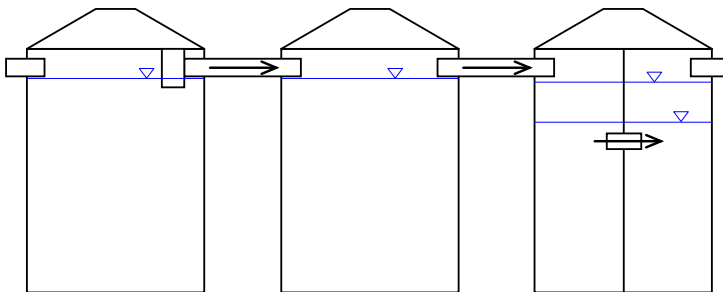


Figure 16: 3-tank system without underwater connection

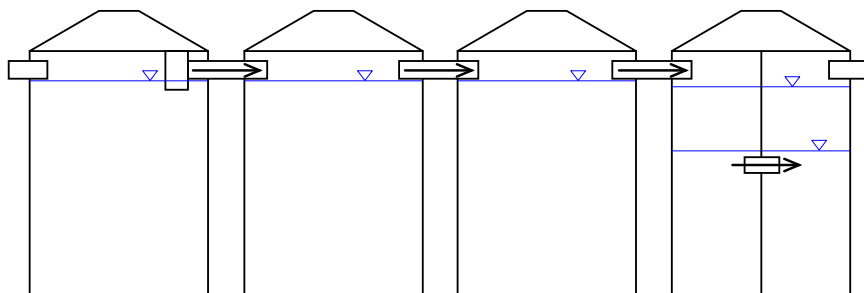


Figure 17: 4-tank system without underwater connection

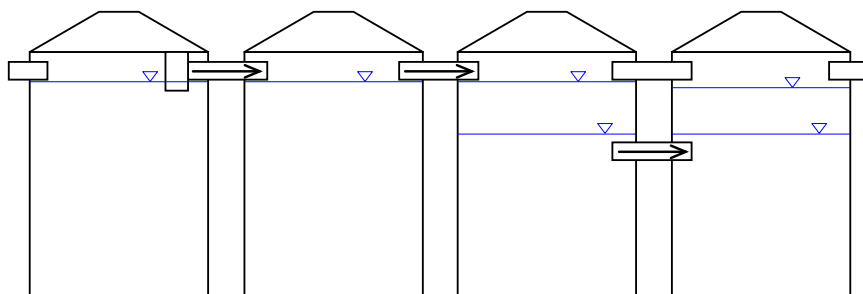


Figure 18: 4-tank system, front tanks without underwater connection

The following describes the procedure for aeration with **standard control**. If the aeration is to be carried out with special control, the air distributions must be adjusted accordingly as described above.

6.4.12.3 1-tank systems with 1 compressor

In a 2-chamber pit, a compressor is used to aerate the first chamber via the front red connection of the controller marked 3; the aeration time is 2/3 of the total aeration time. With the remaining 1/3 aeration time, the second chamber is aerated via the rear black connection marked 1 (see Figure 10 and Figure 19).

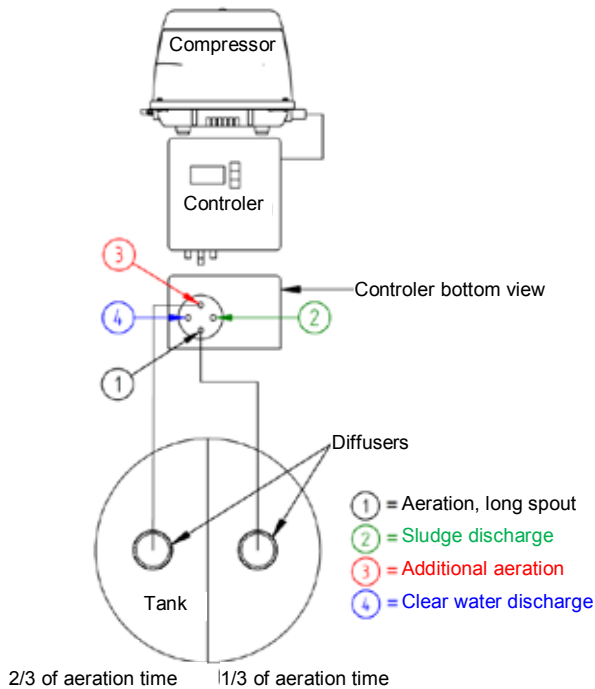


Figure 19: 2-chamber pit

In a 3-chamber pit, a compressor is used to aerate the first chamber via the front red connection of the controller marked 3; the aeration time is 2/3 of the total aeration time. With the remaining 1/3 aeration time, the second and third chambers are aerated via the rear black connection marked 1. The air volume is adjusted with the shut-off valves on the air distributor so that approx. 2/3 of the air is conveyed into the second chamber and approx. 1/3 into the third chamber (see Figure 11 and Figure 20).

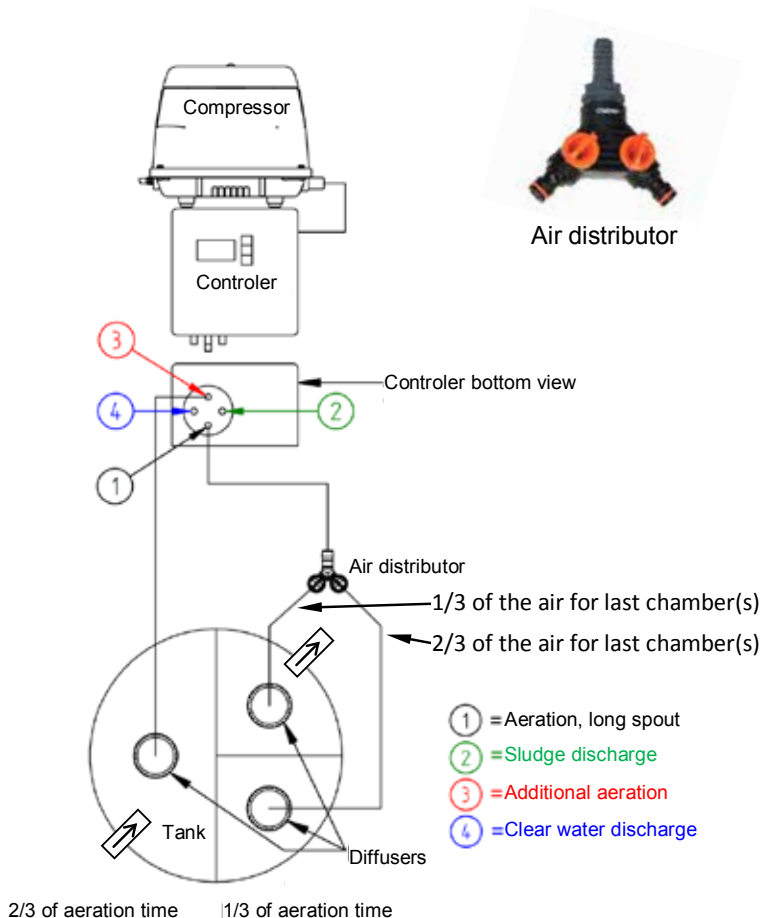


Figure 20: 3-chamber pit

6.4.12.4 2-tank systems with 1 compressor

In a 2-tank system, a compressor is used to aerate the first tank via the front red connection of the controller marked 3; the aeration time is 2/3 of the total aeration time. With the remaining 1/3 aeration time, the second tank is aerated via the rear black connection marked 1 (see Figure 12, Figure 15 and Figure 21).

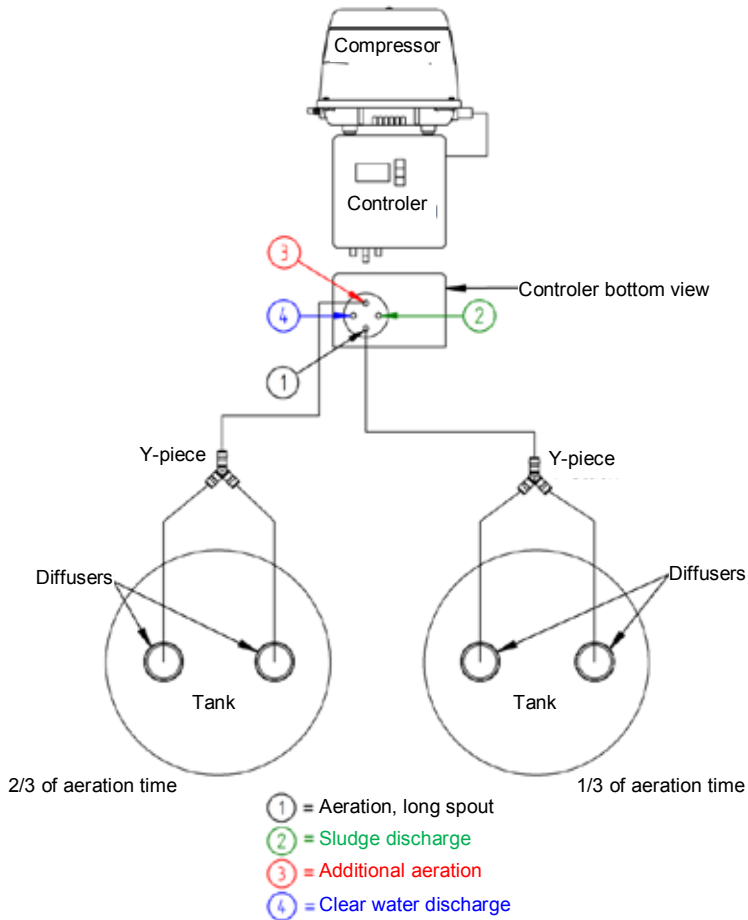


Figure 21: 2-tank system

6.4.12.5 3-tank systems with 1 compressor

In a 3-tank system, a compressor is used to aerate the first tank via the front red connection of the controller marked 3; the aeration time is 2/3 of the total aeration time. With the remaining 1/3 aeration time, the second and third tanks are aerated via the rear black connection marked 1. The air volume is adjusted with the shut-off valves on the air distributor so that approx. 2/3 of the air is conveyed into the 2nd tank and approx. 1/3 into the last tank (see Figure 13, Figure 16 and Figure 22).

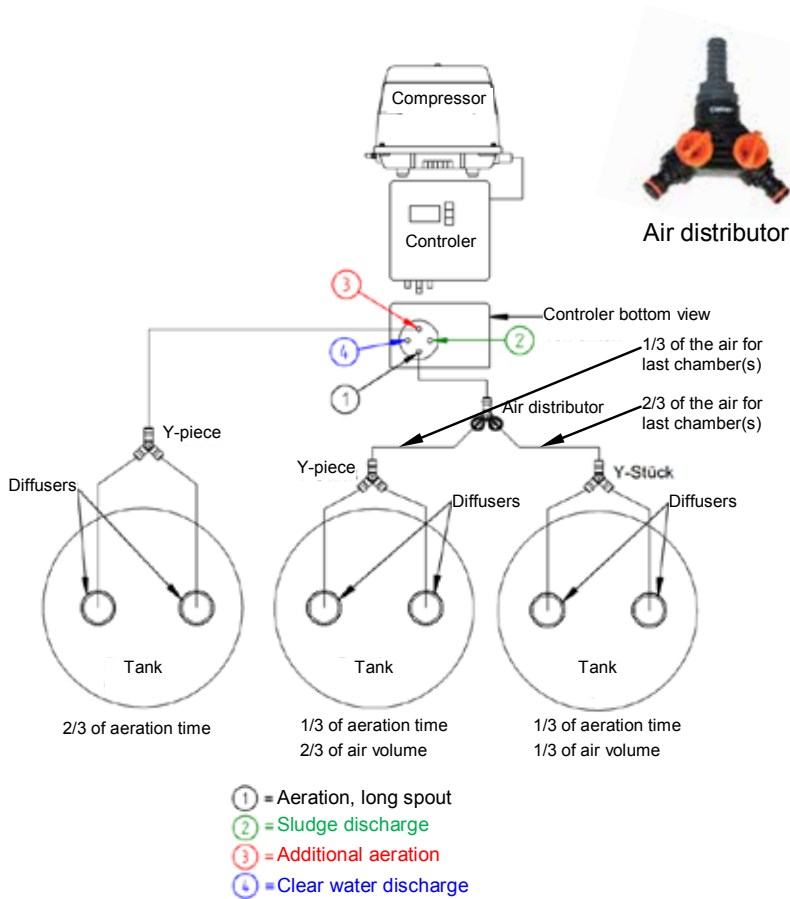


Figure 22: 3-tank system

6.4.12.6 Systems with 2 compressors and 3 tanks

Systems with 2 compressors can only be operated with controllers K-Pilot 18.3 and 18.4, which offer extended connection options (for connection information, see **Controller Operation Manual**). In such plants, the first tank in a 3-tank system is aerated directly by compressor 2 (next to or under the controller in the outdoor cabinet). Tanks 2 and 3 are supplied with air by compressor 1 (located over the controller) via the controller. Tank 2 is aerated via the front, red controller connection marked 3. The aeration time is 2/3 of the total aeration time. With the remaining 1/3 aeration time, tank 3 is aerated via the rear black connection marked 1 (see Figure 13, Figure 16 and Figure 23).

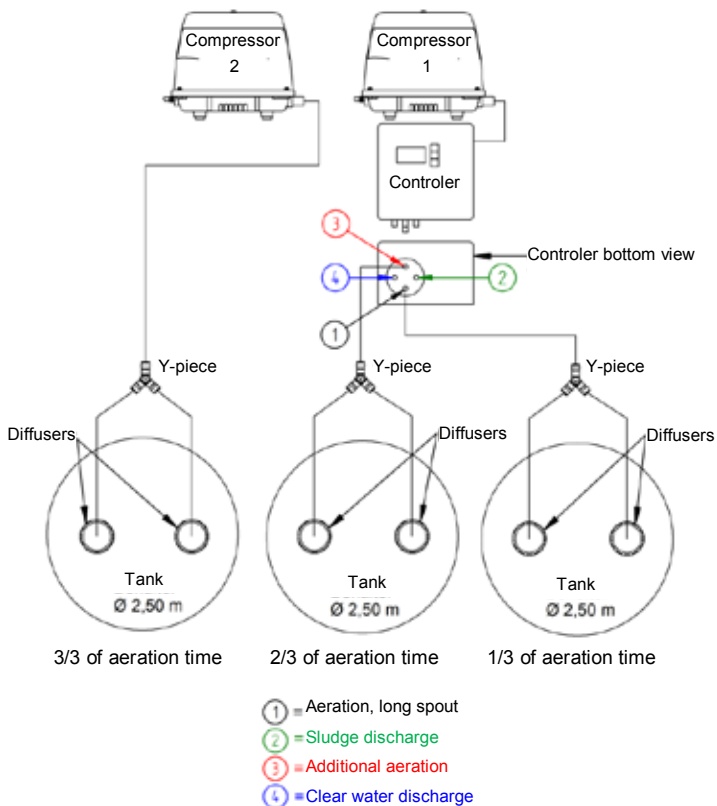


Figure 23: 2-compressor system in 3 tanks

6.4.12.7 Systems with 3 compressors and 4 tanks

Systems with 3 compressors can only be operated with controllers K-Pilot 18.3 and 18.4, which offer extended connection options (for connection information, see **Controller Operation Manual**). In such plants, the first tank in a 4-tank system is aerated directly by compressor 3 (next to or under the controller in the outdoor cabinet). Tank 2 is aerated directly by compressor 2 (next to or under the controller in the outdoor cabinet). Tanks 3 and 4 are aerated by compressor 1 (located over the controller) via the controller. Tank 3 is aerated via the front, red controller connection marked 3. The aeration time is 2/3 of the total aeration time. With the remaining 1/3 aeration time, tank 4 is aerated via the rear black connection marked 1 (see Figure 14, Figure 17, Figure 18 and Figure 24).

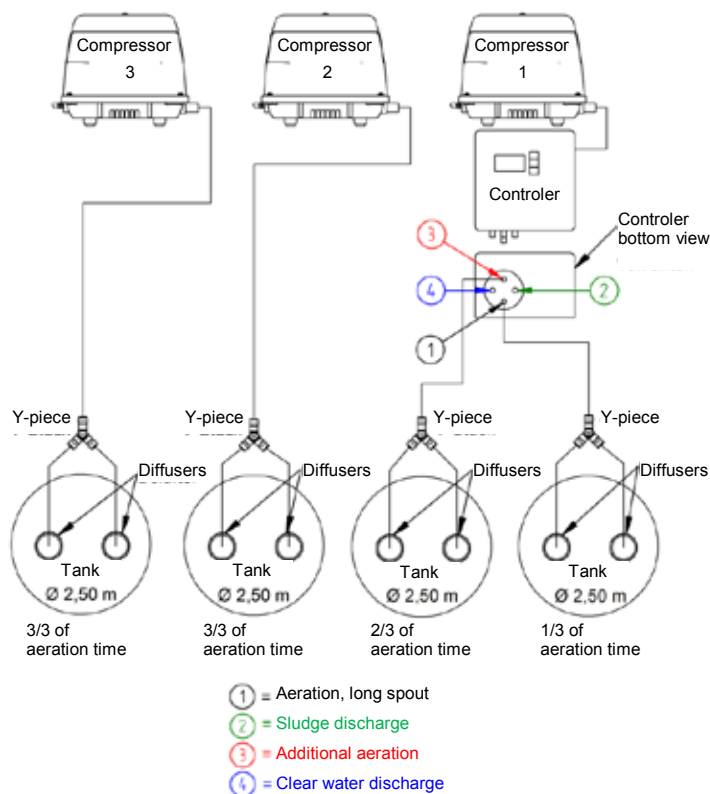


Figure 24: 3-compressor system in 4 tanks

6.4.13 Compressor sizes

The required compressor size depends on the plant size (= PE number – see following table). The specified compressor sizes with the standard hose diameters apply to hose lengths of up to 10 m. The possible calculated water depths are calculated from the water pressure on the membrane diffusers, the air resistance in the hoses, the output of the compressor and some other factors. For this reason, the following maximum water depths apply to the installation of our plants. The specified pressure value can be read from the controller during operation.

Plant size	Compressor size	Max. water depth*)	Max. pressure value
04 – 06 PE	80	1.80 m	280 mbar
07 – 11 PE	120	2.10 m	300 mbar
12 – 16 PE	150	2.10 m	300 mbar
17 – 20 PE	200	2.10 m	300 mbar
21 – 30 PE	2 x 150	2.10 m	300 mbar
31 – 40 PE	2 x 200	2.10 m	300 mbar
41 – 50 PE	3 x 200	2.10 m	300 mbar

*) Higher water levels require larger compressors.

If, for example, a system for 6 PE has to be operated at a water depth $H_{W,max}$ of 1.90 m, a size 120 compressor is required.

Hose lengths over 10 m require larger hose diameters and larger compressors than those specified in the table.

With water depths over 2.10 m, please consult the manufacturer.

6.4.14 Installing the float switch

The float switch is provided with a cable and (optional) hose clamps for attachment to the clear water lifter with different cable lengths (5 m / 10 m / 15 m / 20 m / 30 m).



Figure 25: Float switch

Installation of the float switch:

- The holder is attached to the pipe with hose clamps
- The height can be adjusted by sliding on the pipe
- Set the float switching point to $H_{w,min}$ and the lower switching point to height $H_{w,min}$ by attaching the float switch to the "Float" mark.

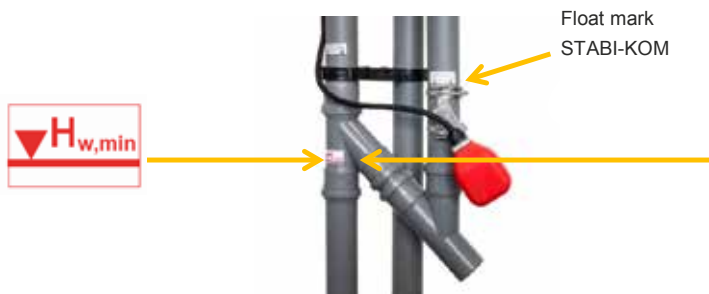


Figure 26: Attachment of the float switch

- Lay the float switch cable through the cable conduit together with the hoses to the controller.
- Connect the float switch cable in the controller to the float terminal (with controller type K-Pilot 18.1 – see **Controller Operation Manual**)

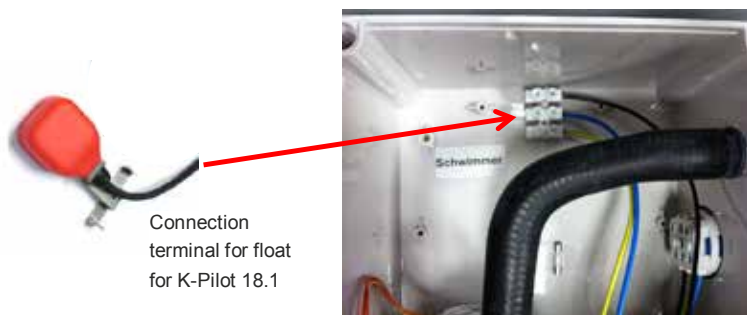


Figure 27: Float switch connection in K-Pilot 18.1

The procedure for connecting a float switch to a type K-Pilot 18.3 and 18.4 controller is described in the **Controller Operation Manual**.

6.4.15 Clear water discharge with submersible pump

The pump of the clear water outlet for AQUATO® STABI-KOM plants was designed as an alternative to the clear water lifter. By using this pump design, it is also possible to pump the purified wastewater over greater distances or heights.

It is only possible to connect a clear water pump with controller types K-Pilot 18.3 and 18.4, which offer extended connection options (see **Controller Operation Manual**).

The pump is already attached to a stainless-steel bracket at the factory. It has a connection cable with a length of 10 m. The float switch for limit value detection is equipped with the same cable length and is also attached to the stainless-steel bracket. The scope of delivery also includes a 3.5 m hose (25 mm in diameter) as a pressure line. Connect the 25 mm hose to the pump coupling. Attach the pressure hose to the tank top with the supplied fastening material and lead it from there into the outlet or first into the sampling bottle and then from there into the outlet. The electrical connection of the pump and float switch is described in the **Controller Operation Manual**. Both must be activated during commissioning or in the "Select plant types" menu (see **Controller Operation Manual**).

6.4.16 Sampling

The (optionally supplied) sampling unit must be connected in the outlet pipe. For this purpose, extend the outlet pipe in the direction of the pit centre so that the sampler can be easily reached without blocking access to the pit. Then fasten the sampling unit to the tank top using the fastening set.

If a clear water pump is used in the plant, a sampling bottle is required instead of an open sampling unit.

6.5 Installation manual for the controller and the compressor

6.5.1 Safety instructions

The controller is intended for wall mounting and is therefore pre-mounted on a bracket. However, it can also be accommodated in a wall cabinet or an outdoor cabinet.



Commissioning is carried out by connecting the controller to the mains.



Only plug in the power plug after all electrical parts – such as the float, additional compressors and/or submersible motor pump – have been connected to the terminals provided in the controller (see **Controller Operation Manual**).



Only allow qualified personnel to carry out the electrical installation. The manufacturer accepts no liability for any damage caused as a result of carrying out the installation on one's own.



Non-compliance with the following safety instructions may result in a limitation or complete loss of liability on the part of the manufacturer.

Only the manufacturer may perform any actions on the device or repairs of any kind.

Before commissioning and switching on the mains voltage, it must be ensured that:

- there is no visible damage to the device and the connection cables,
- in particular the mains connection and the connections of the units are properly connected,
- all connections have been made properly and professionally,
- the laying and routing of all cables and lines comply with the applicable regulations,
- the device is closed properly,
- the plant is properly secured.

Before working on the controller, please note the following important instructions:

- Disconnect the plant from the mains before opening the controller.
- To prevent tearing or damaging cables or hoses, open the control unit carefully and do not simply drop the cover.
- Replace individual fuses only in a de-energized state.
- Never use fuses with currents higher than allowed.
- Do not manipulate the circuitry of the system in any way.
- The relevant applicable regulations (EN, VDE, etc.) as well as the regulations of local energy suppliers must be observed.

- If a fuse is defective, it may only be replaced by a microfuse of the following type: **microfuse, slow-blow, type 3.15 A, 5 x 20 mm** according to EN 60127-2/III with a maximum power loss of 1.5 W. This fuse is also installed at the factory.

Note:

For larger plants, a stronger fuse may be installed (max. 6.3 AT). Always replace fuses with a fuse of the same current rating.



Always replace fuses with a fuse of the same current rating.

Standard: microfuse, slow-blow, type 3.15 A, 5 x 20 mm according to EN 60127-2/III with a maximum power loss of 1.5 W.

For larger plants, a stronger fuse may be installed (max. 6.3 AT).

The cables to the device must be laid correctly. In particular, it is important to prevent high mechanical stress on the cables, e.g. due to insufficiently fixed cables, as otherwise protection class IP 54 cannot be guaranteed.

6.5.2 Controller with wall bracket



Figure 28: Controller and compressor on bracket

The controller is fully mounted on the wall bracket.

- When selecting the installation location, the weight of the finished unit (e.g. 10 kg as in this example) must be taken into account.
- A structure that transmits sound or vibrations is unsuitable for installation.
- The installation site must be dry, clean and well-ventilated – high dust accumulation must be avoided, as otherwise the air filter of the compressor can become clogged.
- Mount the controller with wall bracket vertically and horizontally on the wall.
- Place the compressor on the bracket and connect it to the controller using the 90° hose bend and two clamps provided.
- Plug the plug for the power supply of the compressor into the 230 V socket on the side of the controller.
- Before commissioning the controller, please read Chapter 7 and the **Controller Operation Manual**, in particular the chapter "Commissioning of the controller".

If the controller has to be opened, disconnect the plant from the mains before opening the controller. To prevent tearing or damaging cables or hoses, open the control unit carefully and do not simply drop the cover.

If the compressor is not placed above the controller and thus the hose connection on the controller is turned in another direction, make sure that the hose inside the controller is not twisted.

6.5.3 Controller in outdoor cabinet or wall cabinet

The same principles as described above apply to the installation.

Set up the outdoor column in a shady and wind-protected location. In climatically unfavourable locations, it is important to install a fan for cooling and/or a control cabinet heater for heating, controlled by thermostats. This also applies if an external wall cabinet is used.



Figure 29: Controller and compressor in outdoor cabinet or wall cabinet



Attention: Direct solar radiation must be avoided with all installation variants.

If the controller has to be opened, disconnect the plant from the mains before opening the controller. To prevent tearing or damaging cables or hoses, open it carefully and do not simply drop the cover.

If the compressor is not placed above the controller and thus the hose connection on the controller is turned in another direction, make sure that the hose inside the controller is not twisted.

7 Commissioning of the plant

7.1.1 Prior to commissioning



The relevant accident prevention regulations, guidelines, safety rules and leaflets of the responsible employers' liability insurance association (DGUV), as well as the regulations of the Association of German Electrical Engineers (VDE) must be observed when constructing and operating wastewater treatment plants.

Before commissioning the plant, the installation and setup of the plant components – as described in the **installation manual** – must be completed.

The volumes and structure of the tanks must be designed in accordance with the wastewater treatment and process engineering specifications. The pipelines must be connected appropriately.

Make sure that the roof ventilation functions properly. If it is not sufficient, a separate vent pipe must be installed. Forced ventilation may even be required.

The leak test must be carried out before commissioning.

The technology must be properly installed and connected in accordance with the wastewater treatment and process engineering requirements.



Prior to commissioning, the plant must be filled with water up to 5 cm above $H_{W,min}$.



The electrical installation must have been carried out and completed – by qualified personnel.
(See Chapter 6.5)



7.1.2 Commissioning

The plant is put into operation by connecting the power cable of the controller to the mains. (see **Controller Operation Manual**).



Only plug in the power plug after the float and motor pump, if present, have been connected to the designated devices in the controller.

(See Chapter 6.5)



After plugging in the plug, the controller starts (see **Controller Operation Manual**, in particular the chapter "Commissioning of the controller") with a self-test with a duration of approx. 3 seconds. Then the start message "AQUATO" appears. The display Vx.xx.xx (e.g. V2.07.09) in the lower part of the message is the version number of the software.

The green and red LEDs then simultaneously light up continuously, indicating that the device is in the initialization phase.

Afterwards, the following points must first be worked through when commissioning the controller (see **Controller Operation Manual**, in particular the chapter "Commissioning of the controller"): password, language, date and time, basic type, aeration, plant type with PE number, control type time/float, denitrification and, at the end of commissioning, manual mode.

The standard display appears when manual mode is ended. The device is now ready for operation. This is indicated by a flashing triangle ◀ in the lower right corner of the LCD display. The plant now runs fully automatically.

When a unit is switched on, the green LED lights up continuously. The red LED flashes in the event of a fault/error.



The commissioning engineer must ensure that the parameter settings in the controller have been made in such a way that they comply with the requirements (e.g. effluent class) from the approval and the water law license for the system on which the controller is to be used.

8 Operation

8.1 Responsibilities of the operator

The small wastewater treatment plant must be operated by the owner or a competent person commissioned by the owner (operator).

After commissioning, the plant is operated fully automatically. It is controlled by a PLC. The sequence and flow of the phases are programmed in the controller. The times for the aeration intervals, the denitrification phase (optional) as well as for the discharge of the purified wastewater and the return of the surplus sludge are preset, but can be readjusted if necessary (see **Controller Operation Manual**).

In the standard case, the cycles run on a purely time-controlled basis. However, it is possible to use a float switch and thereby additionally control the plant via the water level.

If any faults occur during operation of the plant, they are reported visually and acoustically by the controller. The red LED flashes and the buzzer sounds. The error message remains in the main display until the error is acknowledged (see Controller Operation Manual). The error message remains stored in the error logbook and can thus be evaluated later.

The controller has a power failure alarm. In the event of a power failure, an alarm tone sequence is generated approx. every 30 seconds in order to notify the operator that wastewater treatment has stopped. If the power supply returns after a power failure, the device switches on again automatically.

In order to guarantee long-term smooth operation of your small wastewater treatment plant, the following **checks** are prescribed by the operator in accordance with the approval:

<ul style="list-style-type: none">• Operation of the system	daily
<ul style="list-style-type: none">• Reading of the operating hours• Visual inspection of the effluent for sludge flotation• Detection and, if necessary, removal of floating sludge• Inspection of inlets and outlets for clogging	monthly

It is not necessary to make a written entry of the operating hours in the operation log when using the AQUATO® STABI-KOM plant, as the controller records the operating hours in an electronic logbook.

Any detected faults or malfunctions must be noted in the **operation log**, reported to the maintenance service and rectified immediately.

The data you collect is important for the maintenance of your small wastewater treatment plant. The more carefully you perform these checks, the easier it will be for your trusted specialist company!

8.2 Operation and displays of the controller

The controller has a graphic LCD display with 128 x 64 pixels. Indications are made in plain text. Operation is carried out via three buttons and two LEDs.

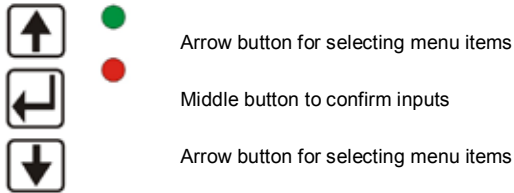


Figure 30: Control elements of the controller K-Pilot 18.1/18.3/18.4 KOMBI

If the green and red LEDs simultaneously light up continuously, the device is in the initialization phase. During operation, the illuminated green LED indicates that a unit (pump or compressor) is running. In addition, a flashing triangle ◀ is visible in the lower right corner of the LCD display, which flashes at one-second intervals throughout operation. In the event of a fault/error, the red LED flashes and the buzzer sounds.

The standard display on the LCD shows the date and time in the top line and the switching status in large letters below, e.g. "AERATION". In the other menus, the name of the respective menu is located at the top and the individual chapters below this. The arrow buttons are used to change from menu to menu. Press the (middle) ◀ button to go to the chapters. The arrow keys are also used to change chapters.

Press the middle ◀ button to enter the input mode of the respective chapter. Input mode is indicated by a selected (inversely displayed) line. The lines can now be selected with the arrow buttons ◀ and ▶. The desired chapter can be selected and the values can be changed by pressing the middle button ◀.

If a multi-digit number input is required, the highest digit is changed first. The middle button is then used to move on to the next digit, etc. If the selection of different options is required for the input (e.g. YES / NO), the desired selection is also made using the arrow buttons. If the desired option appears on the display, it is confirmed with the middle button.

An error is also acknowledged by pressing the middle button ◀. Then the buzzer is switched off, but the error message remains on the display.

For further controller options, see the **Controller Operation Manual**.

9 Maintenance

9.1 Maintenance work

Maintenance must be carried out at least twice per year by qualified personnel only and includes the following activities:

- Inspection of the operation log with verification of regular operation (target/actual comparison)
- Function check of the operationally important mechanical, electrotechnical and other plant components
- Function check of the controller and the alarm function
- Adjustment of optimum operating values, e.g. oxygen supply and sludge volume fraction in activation / secondary sedimentation
- Performance of general cleaning work, e.g. removal of deposits
- Inspection of the structural condition of the plant
- Check to verify sufficient ventilation
- The maintenance performed must be noted in the operation log.

Examinations in the activation/secondary sedimentation tank:

- Oxygen concentration, in each chamber at least 2 mg/l during the aeration phase
- Sludge volume fraction (< 700 ml/l). If necessary (sludge volume fraction > 700 ml/l), the operator should **initiate sludge removal** from the front chamber(s) – but **not from the last chamber**.

As part of maintenance, a random sample of the effluent must be taken.

The following values must be checked:

- Temperature
- pH value
- Settleable solids:
- COD
- $\text{NH}_4\text{-N}$ (performance class D only)
- N_{inorg} (performance class D only)

The findings and work performed must be recorded in a maintenance report. The maintenance report must be forwarded to the operator. The operator must attach the maintenance report to the operation manual and submit it to the responsible building control authority or the responsible water authority on request.

9.2 Sludge volume measurement

To determine whether sludge removal is necessary, the sludge volume in the last chamber must be determined as SV30. The sludge volume must be measured in a 1,000 ml graduated cylinder.

Before sampling, switch on the aeration (if it is not active already) and allow the tank to mix for a short time. Then take a sample of 1,000 ml. Sludge removal is required if the sludge volume is > 700 ml/l.

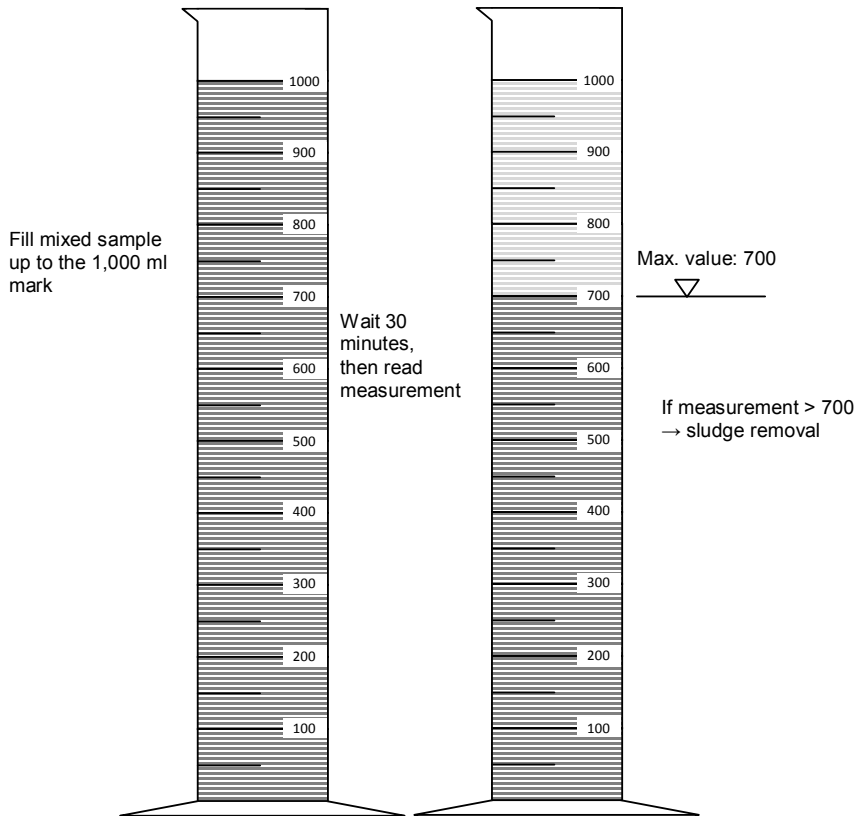


Figure 31: Sludge volume measurement

9.3 Instructions for sludge removal

Sludge is only removed from the front chamber(s), not from the last chamber.



Attention: Sludge must not be removed from the last chamber!

Please note the following when removing sludge:

There is at least one membrane diffuser in each chamber. The membrane diffusers must not be damaged under any circumstances.

Sludge must not be removed from the last chamber!

I.e., for example, for:

Two-chamber pits → removal from the first chamber,

Three-chamber pits → removal from the first and second chamber,

etc.



Attention:

Every chamber has one or multiple **membrane diffusers** that must **not be damaged** during the disposal process.

After sludge removal, the tank(s) must be refilled with clean water to the minimum water level $H_{W \min}$.

9.4 Maintenance of the air compressors

The air compressors are operated without lubricants and are largely maintenance-free. Please refer to the operation manual included in the packaging of the air compressor for the exact procedure for maintenance. Keep this together with the other documents at the plant. Whenever performing maintenance, it is recommended to check the air filter regardless of the compressor type.

9.4.1 Maintenance work on linear diaphragm compressors

- Clean the filter – replace in case of heavy contamination
- Change pump block – replace every 3 years or 15,000 – 20,000 h, depending on the size

9.4.2 Maintenance work on free piston compressors

- Clean the filter – replace in case of heavy contamination
- Check the piston set – replace after approx. 20,000 operating hours

9.4.3 Maintenance work on rotary vane compressors

- Clean the air filter (from DT 4.10) – replace in case of heavy contamination
- Check the carbon fibre lamellae – replace (**always in sets**) in case of drop below dimension acc. to manufacturer specification
- Check the condenser – replace if capacity falls below 10%

10 Decommissioning and disposal



Ensure that only qualified personnel with suitable safety equipment have access to the plant. Ensure that the general safety regulations and the safety regulations at the installation site are observed.

Before starting the final disassembly, switch off the plant by pulling out the power plug. Secure the plant against being switched on again.

10.1 Temporary decommissioning

Temporary decommissioning is required for maintenance work or when replacing the following components:

- Control unit
- Compressor
- Rotary valve
- Wear parts (e.g. membrane diffuser)

10.2 Disassembly of the whole plant

The complete disassembly of the whole plant may only be carried out by qualified personnel.

- Disconnect the hoses and cables from the controller/control cabinet
- Pull out the float switch cable (optional) and the hoses in the direction of the tank
- Remove the tank
- Remove the controller/control cabinet

10.3 Disposal

Ensure that the plant is disposed of properly.

11 Assembly and commissioning checklist

Checklist for the installer

Work performed	Not		Special features
	Completed	completed	
Assembly			
▪ Assembly of the controller/control cabinet	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Air hose connections	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Float switch connection (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
Inoculation of the plant (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
Commissioning	<input type="checkbox"/>	<input type="checkbox"/>	
Function check			
▪ Controller / alarm function	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Air compressor	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Rotary valve distributor	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Membrane diffuser 1	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Membrane diffuser 2	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Membrane diffuser 3 (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Membrane diffuser 4 (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Membrane diffuser 5 (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Membrane diffuser 6 (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Membrane diffuser 7 (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Membrane diffuser 8 (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Lifting unit, clear water discharge	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Lifting unit, surplus sludge discharge	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Float switch (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
▪ Clear water pump (optional)	<input type="checkbox"/>	<input type="checkbox"/>	
Instruction of the operator	<input type="checkbox"/>	<input type="checkbox"/>	
Proper handover of the plant	<input type="checkbox"/>	<input type="checkbox"/>	

12 Maintenance checklist

Checklist for the maintenance service

Work performed	Completed	Not completed	Special features
Inspection of the operation log	<input type="checkbox"/>	<input type="checkbox"/>
Inspection of the structural condition acc. to approval	<input type="checkbox"/>	<input type="checkbox"/>
Check of ventilation	<input type="checkbox"/>	<input type="checkbox"/>
General cleaning work	<input type="checkbox"/>	<input type="checkbox"/>
Function check			
▪ Controller / alarm function	<input type="checkbox"/>	<input type="checkbox"/>
▪ Air compressor	<input type="checkbox"/>	<input type="checkbox"/>
▪ Rotary valve distributor	<input type="checkbox"/>	<input type="checkbox"/>
▪ Membrane diffuser 1	<input type="checkbox"/>	<input type="checkbox"/>
▪ Membrane diffuser 2	<input type="checkbox"/>	<input type="checkbox"/>
▪ Membrane diffuser 3 (optional)	<input type="checkbox"/>	<input type="checkbox"/>
▪ Membrane diffuser 4 (optional)	<input type="checkbox"/>	<input type="checkbox"/>
▪ Membrane diffuser 5 (optional)	<input type="checkbox"/>	<input type="checkbox"/>
▪ Membrane diffuser 6 (optional)	<input type="checkbox"/>	<input type="checkbox"/>
▪ Membrane diffuser 7 (optional)	<input type="checkbox"/>	<input type="checkbox"/>
▪ Membrane diffuser 8 (optional)	<input type="checkbox"/>	<input type="checkbox"/>
▪ Lifting unit, clear water discharge	<input type="checkbox"/>	<input type="checkbox"/>
▪ Lifting unit, surplus sludge discharge	<input type="checkbox"/>	<input type="checkbox"/>
▪ Float switch (optional)	<input type="checkbox"/>	<input type="checkbox"/>
▪ Clear water pump (optional)	<input type="checkbox"/>	<input type="checkbox"/>

Analysis:

	Inlet	Outlet
Oxygen concentration	COD	mg/l
Sludge volume fraction, activation / secondary sedimentation	NH ₄ -N ¹	mg/l
Temperature	N _{inorg.} ²	mg/l
pH value
Settleable particles
Sludge volume fraction		
Primary sedimentation / sludge storage		

¹ only in combination with performance class D

² only in conjunction with performance class D

13 Addresses

Manufacturer	
Company	AQUATO® Umwelttechnologien GmbH
Address	Ernstmeierstr. 24
	32052 Herford
Telephone	+49(0)5221 / 10 21 9-0
Internet	www.aquato.de
E-mail	info@aquato.de

Plant supplied / installed by	
Company	
Address	
Telephone	
Fax	
Internet	
E-mail	

Your maintenance company	
Company	
Address	
Telephone	
Fax	
Internet	
E-mail	

The warranty will void if operation and maintenance of the sewage treatment plant are not carried out in accordance with the instructions and specifications of the operating instructions.

VERSION 10.2019

Installation Company:

AQUATO® Umwelttechnologien GmbH

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