

Installation instructions

AQUATO® PUMP with submerged aerator



Effluent classes <small>(please tick)</small>	C	D	P	H
Serial number				
Date of commissioning				
Tank <small>(please tick)</small>	Concrete	PE	GRP	
Primary volume				
SBR volume				

Fully biological small wastewater treatment plant
for the treatment of household wastewater in accordance
with DIN 4261/ EN 12566-3



CE marking of AQUATO® small wastewater treatment plants

Dear AQUATO® customer,

When you put your AQUATO® wastewater treatment plant together with a tank of your choice, you have to prepare the following documents:

- compliance of the tank according to DIN EN 12566-3 (test for water tightness, durability and stability)
- compliance of the technical equipment
(Included in document!)

Subsequently, the treatment plant has to be installed according to the installation manual. If all criteria of EN 12566-3 and the general approval are met, you can declare the CE compliance according to EN 12566-3. For this you can use the printed form on the next page.

Please enter your company name and address in the free space of the accompanying document and cross out the type of plant / tank material, you do not use.

Additionally, the enclosed CE sticker must be attached clearly visible and durable to the plant, for example, on the control panel.

Thank you for your confidence!

Your AQUATO® -Team





Marketing Authorisation Holder (MAH)



12

EN 12566-3

Prefabricated sewage treatment plants for to the treatment of domestic
wastewater

AQUATO®PUMP®

Concrete / Plastic

Efficiency of treatment:

Efficiency of the cleaning performance
(with a certified daily organic pollution load
 $BOD_5 = 0.06 \text{ kg / d}$)

COB: 87,2%
 BOD_5 : 92,3%
SS: 91,0%

Purification capacity (Design):

Nominal daily inflow (Q_N)
Nominal daily organic pollution load (BOD_5)

0,60 - 7,5 m³/d
0,24 - 3,0 kg/d

Watertightness:
Compressive Strength:
Durability:

passed
passed
passed

Your **CE** sticker



Please attach it clearly visible and durable to the plant, for example, on the control panel.

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We hereby declare that the product

AQUATO[®]**PUMP** for small wastewater

treatment plants from 4 to 50 PE is according to the following directives:

89/106/EC Building Products Guideline

2006/42/EC Machinery Directive

2004/108/EWG EMV - Directive

2006/95/EWG Low Voltage Directive

The following harmonized standards were applied::

EN 12566 - 3 (2009)

EN 61000 - 6 - 1 (2001)

EN 50081 - 1 (1992)

EN 61000 - 3 - 2 (1995)

EN 50082 - 1 (1997)

EN 61000 - 6 - 3 (2001)

EN 60204 - 1 (1997)

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

The declaration of conformity becomes invalid if the product is changed without approval.

Herford, in April 2010



Eckhard G. Bischoff
Managing Director

Foreword

Overview approvals

Tank	Likuent classes	Technical approvals Z 55.3	User approvals Z 55.31
Concrete	C	192	275
	D	191	274
	D + P		356
	D + H	-	357
PE lying	C	277	338
	D	278	337
	D + P	-	358
	D + H		359
PE standing	C	241	-
	D	240	-
GRP	C	265	
	D	264	-

The following pages contain everything you need to know about the installation of your AQUATO small wastewater treatment plant.

We would like to take this opportunity to thank you for the trust you have shown in us by purchasing one of our products.

Please note that the careful installation of the small wastewater treatment plant and the subsequent maintenance are very important for ensuring its optimal performance.

Regular maintenance is stipulated by the authorities.

Concluding a maintenance agreement ensures that the plant and its biological discharge values are continually monitored.

Further information can be requested from your installation partner or maintenance company.

These installation instructions are available for you to download in DIN A4 format as a PDF file on our home page www.aquato.de in the “Downloads” section.

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Safety instructions

Using the AQUATO small wastewater treatment plants for other purposes without the express permission of the AQUATO umwelttechnologien GmbH and / or failing to observe the following safety instructions can endanger or injure people and lead to malfunctions and defects in the plant. In this case, all liability is excluded.

Modifications and unauthorised plant conversions are not permitted.

The AQUATO small wastewater treatment plant must be installed properly and in compliance with the installation instructions before use.

The installation instructions / operating instructions for the control must be read thoroughly prior to assembly and commissioning, and the instructions therein followed closely!

During assembly, installation, commissioning and operation (as well as decommissioning) applicable national standards and regulations must be complied with at all times. All work must be performed by trained specialists with corresponding proficiency certificates.

The user of the plant must be instructed in its use by the fitter.

The applicable national regulations and the specifications on the rating plate must be complied with when connecting the control. The device must only be operated on networks with a safety switch (PE). The connection to the mains must be performed via special fuse protection and residual current circuit breaker. The perfect functioning of the electrical safety measures must be verified prior to commissioning!

The installation must be performed by a qualified electrician.

Always unplug before working on the device.

Cutting or extending the control cable is not permitted. The electrical connection data can be found on the rating plates of the submerged aerator and the submerged pumps.

Do not operate any devices that display malfunctions, have been dropped or damaged in any other way or which clearly have a damaged connection / connecting cable or plug.

Disconnect the plant from the mains before all maintenance and repair work.

The technology can be removed from the tank simply.

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

Special caution is necessary! The applicable accident prevention rules and technological regulations must be observed!

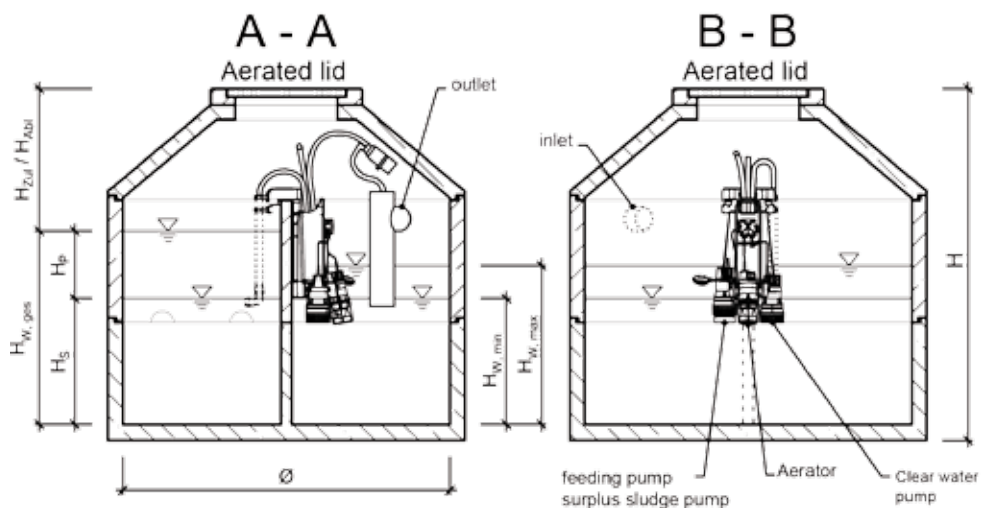
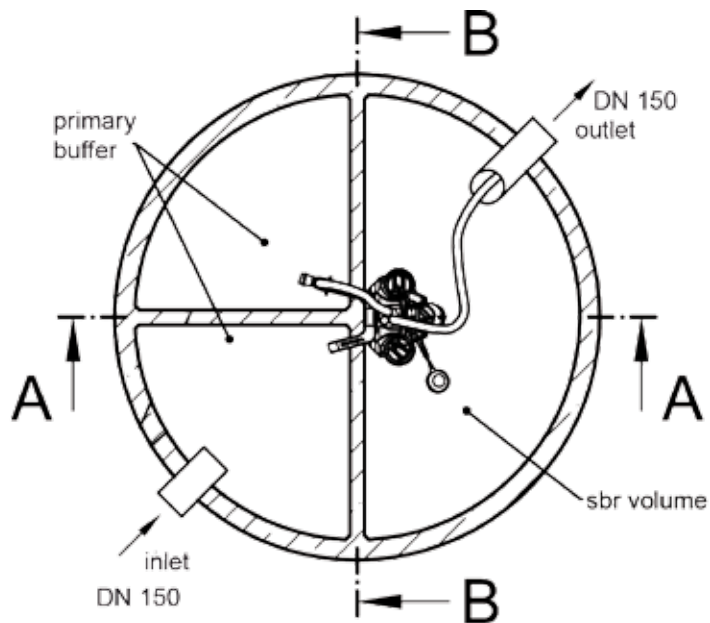
The AQUATO submerged aerator supplies the wastewater with the requisite air by means of a rapidly rotating propeller.

Do not touch anything in the vicinity of the aerator as long as it is connected to the mains. Risk of injury!

In cases of repairs, it is only possible to guarantee correct functioning and the preservation of the guarantee if original spare parts or spare parts approved by AQUATO are employed.



Diagram of the plant (Example model)



Scope of supply

Unit for dividing wall installation:

Pump carrier made of polyethylene

Dividing wall bracket made of polyethylene

PE / stainless steel support frame

Submerged aerator for introduction of air

Submerged pump for clear water outflow

Submerged pump for filling and surplus sludge flush

Submerged tube with filling tube and bend for filling (communicating tubes)

Float switch

Standard connection cable 15 m with special plug for connecting AQUATO with control

Electrical accessories:

Control device 230 V for indoor installation incl. fastening materials

Additional accessories:

PVC corrugated tube for outlet, length 3.0 m, Ø 25 mm

Installation parts and mounting accessories

Instruction plate for emptying the preliminary treatment

Unit for chain installation with differing accessories:

Dividing wall bracket not applicable

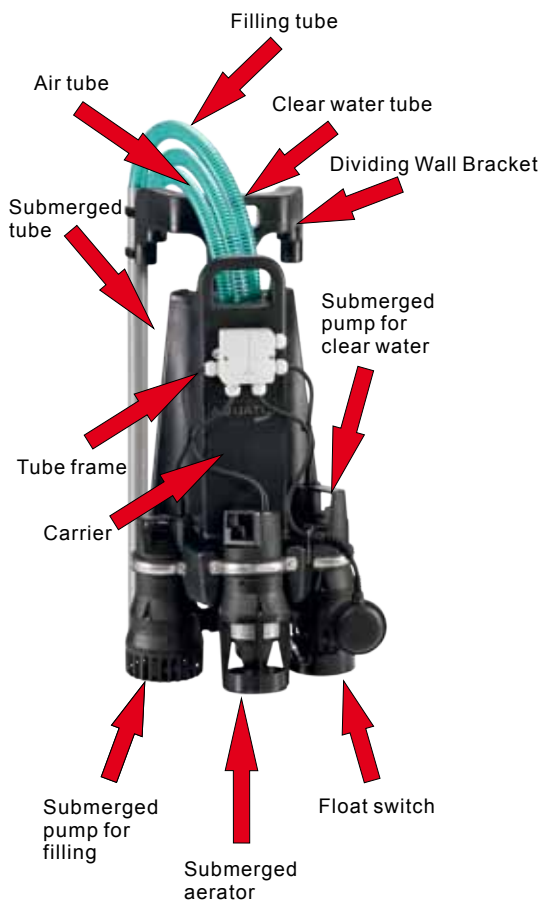
Installation parts for suspension

Feeding hose, Length 5.0m, Diameter: 30mm

Optional accessories for dividing wall and chain installation:

Sampling bottle with lid and holder, as well as installation parts for connection to clearwater discharge hose

Control device



Description of functions

The wastewater treatment plant works based on the activated sludge principle in the backwater procedure (SBR plant). In this procedure the pollutants are removed from the wastewater by floating microorganisms, the activated sludge, collected and converted into biomass.

The water then enters the preliminary treatment stage/coarse trap. From the preliminary treatment stage the backwater is fed into the activation stage every 2 hours by means of a filling tube (communicating tubes). The pump only runs for a few seconds for this process.

Aeration is provided intermittently by a submerged aerator. Part of the air is collected in the air collection tray affixed under the clear water pump and fed into the filling tube. This interrupts the communicating tubes.

The surplus sludge is returned by filling pulses of the sludge pump at the beginning of the aeration phase. The duration of the filling pulses is dependent on the values saved in the control. Once the aeration phase is complete, the resting phase begins.

After the resting phase, the treated water is fed out through the clear water pump. There is also the option of routing the treated water through a sampling unit. The cut-out point for the clear water pump is determined by the float switch. If this minimum water level cannot be reached, a high water alarm will be triggered. The complete cycle takes 8 hours. Then a new cycle begins.

The plant is controlled electronically and can be adjusted to suit the requirements of the situation at hand. The motors' runtimes are shown in the display and documented in the control's memory. During commissioning the plant is set to the maximum connected population total. It is not necessary to change the setting for temporary overloads / underloads.

If no wastewater enters the plant for a longer period of time, the system switches itself to eco-mode automatically. The aeration time is reduced to the point where the microorganisms have sufficient oxygen.

When normal loads return, the plant switches back to the previously set operating mode.

Cleaning capacity

When operated correctly and in optimal conditions the AQUATO wastewater treatment plant can produce results below the legal limits.

Effluent class "D" package

The control has an expanded programme module.

The additional package offers the possibility of increasing the cleaning capacity.

An additional anoxic treatment phase, so-called denitrification, can reduce N_{total} to a value of less than 25 mg/l ($>12^{\circ}\text{C}$).

Sampling

As the pumping-out procedure only lasts a short time, part of the treated wastewater is collected in a suitable recipient (accessories: 1.5 l sampling bottle). The recipient should be positioned in the area of the cover and be easily accessible from above. Alternatively, it is also possible to attach a separate sampling shaft.

Preparation for assembly

Tank preparation using a 3-chamber tank with two quarter-chambers for the preliminary treatment (sludge storage and buffer) and one half chamber for activation (biology) as an example.

- All dimensions must be verified at the installation site.
- The accident prevention regulations must be observed.
- The tank must be installed at the correct height and be waterproof. It must be subjected to and successfully pass a leakage test in accordance with DIN 4261.
- The tank should contain no wastewater and be clean. All of the tank's chambers must be accessible for persons (opening min. 60 cm).
- The lid of the tank must have aeration holes and a separate aeration tube must be installed. The tank must be sufficiently ventilated.
- The inlet must lead into the 1st quarter-chamber.
- Both quarter-chambers should be connected together below the water level.
- The separating wall between the half-chamber and both quarter-chambers must be waterproof.
- An emergency spillway must be created in the area of the separating wall between the two quarter-chambers and the half-chamber (e.g., by means of a notch).
- In two-chamber tanks, a scum board must be placed in front of the emergency spillway in pre-treatment phase (e.g., made of PE). This prevents scum from entering the activation phase.
- The discharge tube is connected to the shaft and extends around 15 cm into the shaft (do not cut off at the level of the shaft).
- An empty conduit of at least DN 100 mm must be laid between the location of the control and the tank. It must not contain include any bends > 30°. A pulling wire should be planned into the empty conduit. The cable conduit must later be sealed off to prevent odours from escaping.
- The location of the control device is supplied with electricity at 230 V and the following individual fuse protection: B 16 A and residual current circuit breaker 25 A / 30 mA.
- The maximal cable length between the control and the treatment plant must not exceed 35 m.

Separating wall between sludge storage and activation basin



Emergency spillway



Installation instructions

Preparation of the AQUATO

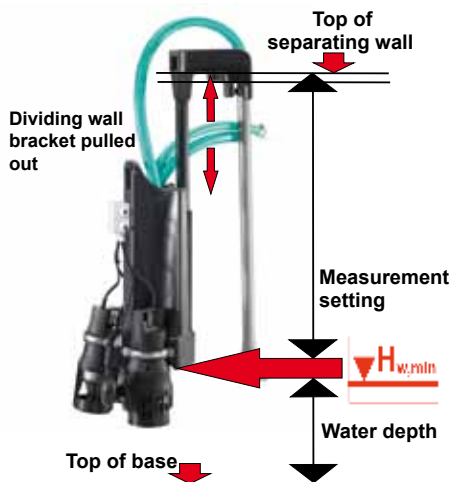
Before inserting the AQUATO into the treatment tank, take the required minimum water level $\nabla H_{w,min}$ in the SBR basin for the planned population total from the "General technical approval".

Determine the exact height of the separating wall. Subtract the measurement of the minimum water level from this height. The remaining measurement is the setting for the AQUATO.

If the setting is correct, the cut-off point for the float switch is now exactly the same as the minimal water level $\nabla H_{w,min}$.

Unit for dividing wall installation

The dividing wall bracket with carrier tube is infinitely adjustable in the pump carrier with low effort. You can position the required setting dimension exactly (lower seating edge dividing wall bracket to lower edge of pump carrier, see picture). With narrow dividing walls (up to 75mm), take the small contact surface as a base, with wider dividing walls (up to 125mm), take the large contact surface as a base. As an additional alignment against torsion, a vertical line runs along the tube, which has to be aligned to the V-groove of the metal plate.



Unit for chain installation

Here the dividing wall bracket is not applicable. The threaded bar - inserted top horizontally into the guide - is provided with an ring lug on both ends. By means of shackles, hooks and chains - 2 x 1.5 m long – the unit is suspended at a appropriate height. Minimum waterlevel is the bottom edge of the pump carrier (see picture above)



On the back of the pump carrier, 3 self-cutting screws are pre-bolted. (In transport position, the middle screw is tightened, please loosen for extraction / twisting). These 3 screws are now onward screwed into the side wall of the carrying tube and fix the plastic carrying tube in the carrying frame.

Note: Do not tighten the 3 screws with a large lever stroke, in order to prevent overtightening.



Installation instructions

Inserting the AQUATO

When assembling on a separating wall (tank with 2 or 3 chambers), the AQUATO is placed on the separating wall. **Caution!** The dividing wall edges have to be rounded off. When assembling in a tank without a separating wall, the AQUATO is fastened in the upper part of the tank, e.g., on the cone / flat lid, with screw hooks.

The submerged tube with the filling tube must be inserted in the 2nd preliminary treatment stage. If there is only **one** preliminary treatment stage, a scum board (e.g., made of PE) must be placed in the area of the submerged tube to protect against scum. For chain systems, the filling tube must not sag (no formation of impasses); it must curve upwards so that an air pocket forms at its highest point, which separates the communicating tubes.

The supplied short discharge pipe is connected to the clear water tube with a coupling connection and inserted approximately 50cm into the tank discharge, where it is fixed in place to avoid it slipping out (see also Sampling possibility). The unpressurised clear water outflow must be guaranteed.

Affix the "WARNING BIOLOGY" sign.



Sampling possibility

An integrated sampling possibility is foreseen. Our available model is composed of:

- a holder, which is inserted in the tank in such a way that it poses no hindrance to the installation / removal of AQUATO and it is still possible to remove the bottle easily.
- a special lid for the sampling bottle with the possibility to connect to the 25 mm clear water tube.
- PE wide-necked 1,500 ml bottle as a sampling bottle.



Cable connections

Route the control cables of the AQUATO through the empty conduit to the control. Standard cable length 15 m (optionally available from 15 m to 35 m in 5 m increments).

Insert the special plug in the control's socket and screw tightly.

The control device must not be connected to the mains yet!

The operating instructions must be observed before connecting to the mains.

! Before commissioning the plant, fill the preliminary treatment stages and the biology with water up to the top part .

Declaration of conformity

EU – Declaration of conformity

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Germany
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We hereby declare that the product

AQUATO® / AQUATO® KOM

for small wastewater treatment plants from 4 to 50 PT conforms with 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

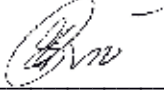
The following harmonised standards have been applied:

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 text certifies the compliance with the directives listed above, but does not contain any assurance of characteristics.

The declaration of conformity loses its validity, if the product is modified without express approval.

Herford, June 2010



Eckhard Bischoff
Managing Director

Version: 2012-08-09



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