

Innovations for clean water





# Installation Instructions

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Please read through the instructions completely and thoroughly.

The general information and installation conditions are presented on the first pages with representations of the PUROO<sup>®</sup> components in the concrete tank. The details for the installation, from page 10 onwards, can be identified using an example of an installation in a plastic container (Type: Graf).

### Brief description of the plant

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

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

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

With the clarified water removal the outlet of the buffer tank in the direction of the pre-treatment stage [1] is closed and the treated wastewater is transported via the purged sampling section of the buffer tank [7] into the outlet.

The overflow baffler is turned in the opposite direction in the intake area [8] of the air lift pump [6], thus avoiding the influencing of the quality of the discharged clarified water through overflowing untreated wastewater.



On reaching HWmin the float valve switches over to aeration and a new cycle starts.

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

# Scope of delivery

View of the preliminary treatment stage

#### View of the aeration stage



Pos.	Component	<b>1-10 PT</b> <b>Quarter</b> <b>chamber</b> ArtNo.: 0020 0001	<b>1-16 PT</b> Half chamber ArtNo.: 0020 0003	1-14 PT Poly ArtNo.: 0020 0005	<b>1-6 PT</b> <b>Poly Aplast</b> ArtNo.: 0020 0012
1	Buffer tank with dividing wall fixture	1 x	1 x	1 x	1 x
2	Sampling hose	1 x	1 x	1 x	1 x
3	Float switch with 15 m cable	1 x	1 x	1 x	1 x
4	Air lift pump (multipart, insertable)	1 x	1 x	1 x	1 x
5	Float valve with pipe fixture and flexible hose	1 x	1 x	1 x	1 x
6	Pipe aerator	1 x 820 mm	2 x 820 mm	1 x 560 mm	1 x 560 mm
7	Overflow baffler	1 x	1 x	1 x	1 x
8	Discharge pipe set (2x 750 mm pipe, each 1x bend 15°, 45°)	1 x	1 x	1 x	1 x
9	Air hose Ø 16 mm	18 m	18 m	18 m	18 m
10	Compressor type Secoh	80 l/min	100 l/min	80 l/min	80 l/min
11	Control unit 230V for internal installation	1 x	1 x	1 x	1 x
12	Mounting material incl. type plate	1 x	1 x	1 x	1 x

# General information on installation (using the example of a concrete tank)



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

# Further prerequisites for the secure operation of the plant

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

### Assembly of the plant components – overflow baffler

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

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

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

With poly-tanks, the baffler is fed through a lip-seal in the partition wall and does not require to be attached using the connection.

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

The connections must be secured against turning using screws!



#### Assembly of the plant components – preparation of the pipe set

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

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

The pipe set is supplied for partition wall heights > 1.66m.

With smaller partition wall heights, the pipe set must be shortened at two positions (see marking diag. left) and the flexi-hose shortened by the difference between 1.66 m and the actual partition wall height. The suction pipe is to be shortened by a max. of 31 cm (see table below)!

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

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

Pipe set reduction table				
Partition wallReduction feedReductionheight [cm]pipe + flexi-hosesuction pipe[cm][cm][cm]				
160	6	6		
150	16	16		
140	26	26		
130	36	31		
120	46	31		
The minimum partition wall height is 1.20 m.				

Intermediate measurements are to be interpolated.



#### Assembly of the plant components – Assembly of the plant

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

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

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

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

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



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

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



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

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

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

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



Measuring the height of the partition wall.

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

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



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







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

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

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

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

Before installing the pipe set, fit the assembly bracket on the partition wall.

The bracket must have a separation of 20 cm to the cone opening on the overflow baffler side (see diag. centre)!

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

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

Place the pipe aerator centrally in the biological stage and lead the air hose behind the overflow baffler and alongside the combitank to the air distributor.

Thus it is ensured that the air hose does not hinder the function of the (diag. below left/right).







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

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

Place the cone onto the tank.

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

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

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

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





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



#### Short instruction for installation in Rewatec-tanks

The installation in the Rewatec-tanks is similar to the installation of the system into Graf-tanks. Different is the position of the assembly bracket and the the length of the pipe (airlift).

Fix after installing the overflow baffler on the opposite side of the emergency overflow (see figure at right) the assembly bracket with four screws 5x50 mm 15 cm aside the emergency overflow.

Assemble the pipe set as shown in the table below and secure the sleeve using the inserted screws.

Behälter- Typ	Height of partition wall [cm]	Shortening of feed / suction pipe and flexi-hose [cm]
Rewatec ML 35/45	139	27
Rewatec ML 60	161	5

Go further with the installation steps as described on page 11.







#### Short instruction for installation in Aplast-tanks

The installation into the Aplast-tank-type is similar to the installation of the system into Graf-tanks. Here is a connecting pipe passed through the dividing wall by default, to where the parts of the overflow baffle will be plugged on.

To fix the pipe set screw nuts are inserted in the dividing wall (see figures at right).

The pipe set and flex hose is not cut for use in Aplast-tank.

Go further with the installation steps as described on page 13.





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

Example: Compressor + control system on console

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



Install the control unit either directly to the console on a stable wall or in the cabinet which can be supplied as accessory (inside cabinet/open air column). The maximum separation between tank and mounting location of the control unit may not exceed 10 m.

Following the drawing though of the air hose and the float lead the empty pipe is to be closed airtight using the plugs supplied (see diag. below) and, if required, additionally sealed using polyurethane foam or mortar!



# INSTRUCTION- AND MAINTENANCE MANUAL

# FOR ELECTROMAGNETIC AIR PUMP



# MODEL :

# JDK-60, JDK-80, JDK-100, JDK-120

- release 29.01.2014 -





#### We thank you for purchasing our air pump. Prior to use, it is kindly requested that the instructions in the columns of WARNING in this manual should be read carefully to understand the equipment well. Please keep this manual available in case of need.

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# 1.Name Of Parts



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#### 2. Instructions

- Prior to operation, read "Instruction" to ensure the air pump is put in operation correctly.
- Be sure to follow the instructions herein described, especially, the following safety instructions.
- Each time after reading this Manual, keep it in a designated place so that the user has access to it at any time.



High potential risks resulting from improper handling, as it can cause death or serious injuries.

#### 2-1 Prior To Operation



O This air pump is not designed to be mounted on the vehicle. So, do not install it on the vehicle.



- O In applications where the stop of air supply can never be allowed , such as fish raising, a spare air pump should be provided.
  - •Make sure to operate the spare air pump every other month to confirm its proper operation.

#### 2-2 Storage and Transfer



•Do not carry the air pump by holding the power cord, which may cut the wires in it. It may cause heat or ignition. Wear gloves not to be burnt due to the body can heat up during operation.

- O Do not store the air pump in a place where the ambient Temperature is below -10°C. The magnet inside the air pump is weakened, and as the result, the equipment will not perform as intended.
- O Do not store the air pump in any areas sunlit directly or at high temperature. Rubber parts inside the air pump will have natural deterioration.



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#### 2-3 Installations



- O Installation of the air pump (including wiring and piping) should be done by our distributor or a specialist.
  - •Improper installation done by yourself will cause air leak, electric shock or fire.

1) Instruction to Location of the Air pump



- O Do not install the air pump in a place where it can be submerged by rain or snow.
  - •Electric leakage or shock will be caused by water leaked in the charged part of the submerged air pump.







- O Set the air pump in the shade and well ventilated place.
  - •The lives of the diaphragms and valves in the air pump may be shortened under quite high temperature caused by the heat of the sunlight. When installing the air pump outdoors, be sure to use a waterproof receptacle.
- O Do not set the air pump in a humid or dusty place such as drift.
  - •The lives of the diaphragms and valves of the air pump may be shortened by the overheat of the air pump due to the less suction air through easily blocked filter element in a dusty place.



O Set the air pump in a place where working space for maintenance can be secured.

2) Instruction to Electric Installation



Instruction to Mounting



- O The exclusive mount for air pump installation made of concrete should be arranged. The mount should be away from the foundation and its height should be min 10cm higher than the foundation.
  - •Noise may be caused by vibration of the air pump mounted on an unstable place such as concrete blocks, shelf etc.
- O Install the air pump on a horizontal mount taken a level after the concrete has completely set.
  - •Setting the air pump before concrete has been completely dry can embed it therein.
  - •The load caused by setting the air pump in a position out of the life of the parts.
- O A ventilation fan should be put in a fence for water, noise proofing to keep temperature inside the fence below 40°C.

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#### Instruction to Piping

- OThe pipe to discharge air should be hard chloroethylene vinyl pipe VP13(ID13mm × OD18mm).
- O Air piping line should be as short and straight as possible.
  - The total length of air piping should be shorter than 5m approximately. Please consult with us if air piping is longer than 5m.
- O Make sure that no particles of soil etc are left in the in the piping under its construction.
  - Extra pressure caused by the piping longer than 5m, piping will be applied on the air pump, which will result in overheat of the air pump. It may shorten the life of diaphragms and valves.
- O Connect the air pump to the air piping with an accessory L-joint hose, and secure the connection with a hose band.
  - · Adjust the locations of the air pump outlet and air piping so that no forcible loads are applied to the L-joint.
- Instruction to Operation



. \_ \_ \_ \_ \_ \_ \_ \_ \_ O Disconnect all appliances in the aquarium or pond from the supply mains before putting your hands into the water.

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CAUTION

#### 3. Daily Maintenance

- O Prior to maintenance servicing, pull off the power cord to stop operation of the air pump.
  - Dust could enter the air pump and cause troubles such as leakage or short circuit.



# **3-1 CLEAN THE FILTER ELEMENT QUARTERLY.**

- 1) Undo the truss head screw.
- Remove the filter cover by puling off in the direction shown.
- Take out the filter element, and slap down dust by hand. If it is heavily contaminated, wash it by rubbing using neutral detergent. Then, wash with water and dry it in the shade.
- Please confirm whether there is any sewage or dirt blocking the inlets (4 points). If yes, please clear it up.
- 5) Reassemble the filter element back in place, and press in the filter cover. (into the position shown,)
- 6) Secure the filter cover with truss head screw.



- O Do not wash with water.
- O Squeeze the rag thoroughly and wipe it.
- O Do not use benzene or thinner, as it can damage coating.

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## **3-2 DAILY CHECKS**

- O Is air blowing out properly?
- O Isn't the air pump making abnormal noise or vibrations?
- O Is the temperature of the air pump not abnormally high?
- O Is the power cord or plug not damaged, swelled or discolored?
   ※ if any irregularity is found, read REPAIR AND ITS ORDER.

# 3-3 CHANGE OF FILTER ELEMENT, VALVEBOXES AND

# **MEMBRANES EVERY 12-18 MONTHS**

The following recommendations regarding the maintenance frequency result from the experience of our customers in using SECOH air pumps at ambient temperatures between -10°C und +40°C and an air humidity of below 80%.

Type/Model	up to 150 mbar max. working pressure*	up to 200 mbar max. working pressure*	up to 250 mbar max. working pressure*
JDK-20 to JDK-50	36 Months	18 Months	-
JDK-60 to JDK-120	36 Months	24 Months	18 Months

\*) max. working pressure is added from

- The maximum watercolumn above the aeration components (e.g. diffusers)
- + loss of pressure caused by the aeration components (generally 50-70 mbar)
- + loss of pressure caused by magnet-/non-return valve
- + loss of pressure caused by reduced diameter of the airpipe/-hose (inner diameter smaller than 17mm/19mm) and/or caused by bends or elastic deformation
- a) Undo the four corner bolts and remove the overall cover. In case the overall cover is hard to remove, insert a slotted screwdriver in (A). Please pay attention that you don't destroy the gasket.



b) Remove the shock absorber. Undo the screws and remove the holder cover.



c) Undo, remove and replace Membrane and Valvebox on one side completely and do it afterwards on the other side in the same way. Start with undoing the screw and removing the valvebox of one side, pinching the hose clamp. Undo and remove the diaphragm.



- d) Set the new diaphragm to the magnet and fix them.
- e) Set the new valve box and fasten it with the four corner screws.
- f) Make sure that clearance between the magnet and the solenoid of both sides is even.
- g) Connect the exhaust port of the valve box with the connecting pipe and tighten it with the hose clamp securely.
- h) Reset the auto-stopper if necessary. Connect power and confirm the operation.
- Fasten the holder cover with the four corner screws and put the shock absorber back into place.
- j) Put back the overall cover into place and fasten it securely by the nuts and bolts.

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#### 4. After-sale Servicing

#### 4-1 Repair and its Order

 $\circ$  When "fail" is doubted, read the following and check it again.

Phenomena	Checks	
●The air pump does not work.	•Doesn't the power supply give out?	
<ul> <li>The discharged air volume decrease.</li> <li>Abnormal temperature rise.</li> <li>The air pump sometimes operate and sometimes doesn't.</li> </ul>	<ul> <li>Is the piping or diffuser pipe not blocked?</li> <li>Doesn't the valve in the piping shut?</li> <li>Is the filter element not blocked?</li> </ul>	
●Noise is abnormal.	Is the air pump not in touch with the surrounding articles?	

 If the failure is found even after checking above points, remove the plug to stop operation. Then, call the distributor or service shop with the following information.

Air pump type: Electromagnetic type

Model: JDK-00 (Refer to name plate attached) Failure mode: As detailed as possible.



O Do not continue the operation as it runs abnormally.

- Continue running will case of leakage, electric shock or short circuit.
- O Do not proceed with repairing by yourself.
- Improper repairing will be cause of leakage, electric shock or short circuit.
- O When there is any question about after-sale servicing, please consult with our distributor or service shop, or our customer service office nearby.

#### 4-2 Replacement Parts

- O Do not use any parts for replacement other than genuine parts.
  - Parts other than genuine parts may have different size, and so the air pump will
    not only perform as intended but also cause to be broken.
- O Such parts as in the following replacement parts list will lose their original function by wear out, deterioration etc during operation.



- O In order to ensure long time service of the air pump, it is recommended that diaphragm and valve should be replaced at least once each year.
- O The replacement parts will be available for seven(7) year after production stop of the pump.

- Customer Service Office -

#### www.secoh-europe.com

Head Office : BIBUS

: BIBUS GmbH, Lise-Meitner-Ring 13, DE-89231 Neu-Ulm, Germany

Tel: +49-731-20769-0 Fax: +49-731-20769-620

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# 5. Specifications

Model		JDK-60	JDK-80	JDK-100	JDK-120	
Rated Voltage V		220 - 240				
Frequency Hz		50				
Oper. Press. kPa		20				
Air capacity <sup>1)</sup>	L/min	60	75	95	120	
Power	W	38 – 43	50 – 55	75 – 80	90 – 100	
Outlet diameter	mm	O.D. 19 (hard vinyl chloride pipe VP13)				
Mass	Kg	Approx. 6.5 (metal) / 5.0 (plastic)				
Standard accessories		L-Joint hose (with hose band)				

1) The air capacity power in the specifications shown are typical values in service at operating pressure, and so these are not guaranteed values.

INDB057-1404-02

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Installation Instructions PUROO<sup>®</sup>

#### Notes





#### **ATB WATER GmbH**

Südstraße 2 32457 Porta Westfalica Germany

Fon: +49 5731 30230-0 Fax: +49 5731 30230-30

E-Mail: info@atbwater.com Website: www.atbwater.com