Innovations for clean water

AQUAMAX® BASIC / CLASSIC

Operating Instructions

Contents

Dear customer,

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

On the following pages you will find everything necessary about the ioperation and the maintenance requirements of your AQUAMAX® small wastewater treatment plant.

Please observe that the maintenance are very important for a good treatment performance.

General and Safety Information

With the AQUAMAX® one is concerned with a technical system which, in combination with a multi-chamber tank, is employed as small wastewater treatment plant for the aerobic biological treatment of domestic and comparable wastewater of up to 75 PE from single or several buildings. Dimensioning, design and operation are to take place up to 50 PE in accordance with EN 12566-3.

With employment in accordance with regulations no hazards whatsoever emanate from the plant. If the AQUAMAX® is used for other purposes without the explicit approval of ATB WATER GmbH and/or the following safety information is ignored, this can lead to the hazarding or injury of persons and to malfunctions or defects in the plant. In this case any liability is excluded, Modifications to the plant or unauthorized conversion is not permitted.

The AQUAMAX® and accessories are not intended to be used by persons (including children) with limited physical, sensory or mental capabilities or due to a lack of experience and/or knowledge, unless they are supervised by or receive instruction from a person responsible for their safety, as to how the AQUAMAX® and accessories are to be used. Children are to be supervised in order to ensure that they do not play with them.

Before use the AQUAMAX® is to be installed correctly and in agreement with the installation instructions. Installation instructions, operating and maintenance instructions are to be read thoroughly and the instructions included therein are to be followed implicitly.

With assembly and installation, commissioning and operation as well as, if required, decommissioning, national standard specifications and regulations are to be complied with. All tasks may be carried out by trained and qualified specialists with appropriate certificate of technical qualification. The operator is to be instructed by the fitter.

With the connection of the control system the national applicable regulations and the details on the type plate are to be complied with (mains voltage, frequency etc.). The equipment is to be operated on a network which includes a protective earth conductor (PE). **Attention is to be paid to correct phase connection (even with plug-in design)!** The connection to the mains must take place by means of separate fusing and residual current protective circuit breaker. Before commissioning, the correct function of the electrical protective measures must be checked!
The installation work is to be carried out by qualified electricians only. With work on the equipment fundamentally the mains plug is to be disconnected. A separation or extension of the cable is not permitted. The electrical connection data is to be taken from the type plate on the equipment.

Operate no equipment which has a damaged connector/connection cable or plug, which indicates a malfunction, has been dropped or has been damaged in any way.

With all maintenance and repair work the plant is to be disconnected from the mains. The AQUAMAX® can be removed easily from the tank. If the plant is to be climbed into, this may take place only with the presence of a second person (this is fundamental!). Particular care is to be

taken. The applicable accident prevention regulations and rules of technology are to be complied with.

In the versions with submersible aerator the AQUAMAX® feeds the required air to the wastewater through a rapidly rotating propeller. Never work in the vicinity of the aerator as long as the AQUAMAX® is connected with the mains. Danger of injury!

The correct function can only be guaranteed with the employment of original spare parts or spare parts approved by ATB. Before commissioning, all points of the operating instructions are to be checked. Keep these instructions readily to hand at all times!

Explanation of the warning notices used:

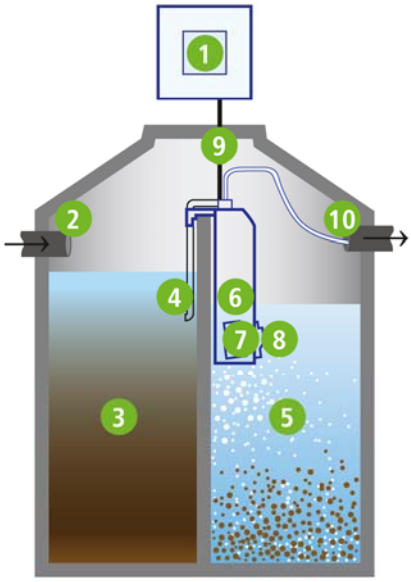

Attention!


Danger due to electrical voltage!


Rotating parts. Danger of crushing and being drawn into the area of the submersible aerator!

Functional Description

AQUA*max*® technology



1. control panel
2. inflow
3. primary
4. feeding pipe / feeding unit
5. SBR biology-reactor
6. frame
7. pump
8. aerator*
9. connection cable
10. outflow

*alternatively membrane tube diffuser on the tank bottom

The wastewater treatment plant works according to the activated sludge principle using the retention process (single tank or SBR plant). With this, the contaminants from the wastewater are taken up by suspended micro-organisms (activated sludge) and converted into biomass.

The wastewater first reaches the coarse interceptor. Every 2 hours – according to the principle of a communicating pipe and with the aid of an excess sludge pump – the retained wastewater is fed into the aeration stage. The aeration takes place intermittently via a submersible motor aerator or with a compressor and membrane tube diffusers on the tank bottom (CLASSIC ZB).
After 6 hours the aeration phase ends and the settling phase begins.

After 2 hours settling time the treated wastewater is pumped out using the clarified water pump. The switch-off point is determined via a float switch. If, as a result of a pump defect, this minimum water level is not achieved an alarm is triggered. After ca. 8 hours, with the end of the clarified water removal, the cycle is ended and a new one begins.

The control unit can be matched to the respective requirement case. With commissioning the plant is set to the maximum number of persons connected. A modification of this setting is not required with short-term over or underloading.

The plant achieves its full treatment performance after a run-up period of ca. one month. With more extreme underloading or temperatures under 12° C it can also take longer until the biology has developed completely. In this case it is recommended to seed using activated sludge in order to accelerate matters.

With the AQUAMAX® BASIC charging, removal of excess sludge and the drawing off of clarified water take place using only one pump. The water streams with this are fed into the individual areas using a patented hydraulic system.

Holiday / energy-saving operation
If, over a period of more than 4 hours, no wastewater flows into the plant, then the system switches automatically into the energy-saving holiday operation. The aeration time is reduced to the point that the micro-organisms just have sufficient oxygen available. With normal loading the plant switches back into the operating mode set.

Sampling
As the pumping out process is of a short duration only, the treated water is collected into a suitable container in the filtering tank (accessory: 1.5 l sampling bottle). The container is mounted in the vicinity of the cover and is thus easily accessible from above.
Alternatively a container can be deployed in a separate sampling shaft.

Installation and dimensioning
Dimensioning and statutory installation conditions are described in more detail in the German National General Technical Approval.

Operation and maintenance
Small wastewater treatment plants must be checked by the operator at certain intervals as well as being serviced twice a year by a specialist. Both are important for a correct operation of the plant. The sludge removal of the primary settling stage takes place, depending on utilisation, once a year or as required.
Further details on this can be taken from the corresponding chapter.

Application possibilities
The AQUAMAX® is conceived for the treatment of domestic wastewater. The following may not be fed to the small wastewater treatment: commercial/trade wastewater (insofar as it is not comparable with domestic), infiltration water (e.g. drainage water), cooling water, runoff water from swimming pools, precipitation water.

Technical data
The AQUAMAX® consists of the following electrical units:

- 1 (BASIC) or 2 submersible pump(s)
- 1 or 2 submersible motor aerator(s) or compressor(s)
- 1 float switch
- 1 control unit

The units are designed for 230V, 50 Hz.
In addition, the AQUAMAX® consists of a carrier frame, pipelines and hoses.
The electrical components are subjected to systematic wear. In individual cases these components must be exchanged after 2 years. The service life of the units, from experience, lies between 5 and 10 years.

Treatment performance
The AQUAMAX® meets the following limiting values (with standard conditions and correct operation):

- BOD_5: 20 mg/l
- COD: 90 mg/l
- NH_4N (>12°C): 10 mg/l
- N_{tot}: 25 mg/l (>12°C)

Control unit ATB*control*© 3

General and safety information

With intended employment of the equipment no hazards whatsoever emanate from the unit. National applicable regulations and technical data are to be observed.
Should the ATB*control*© 3 be used for other purposes without the express approval of ATB WATER GmbH and/or if the following safety information is disregarded, this can lead to malfunction of or defects in the plant. In this case any liability is ruled out.
Modifications to the unit are not permitted and lead to the loss of all claims under warranty.

Do not operate any unit which indicates malfunctions, has been dropped or is damaged in any way.

Features

- Microprocessor controlled
- USB connection for data readout and input
- Splash water protected. Conditionally suitable for outside areas (IP54)
- Wall mounting
- Voltage failure detection system (UVS®)
- Potential-free contact for an additional alarm facility
- Simple and rapid operation
- Times for all parameters completely pre-programmed
- Automatic run-in phase with suppression of excess sludge removal
- Parameter settings freely selectable
- Alarm interval
- Alarm volume adjustable
- Deployable for AQUAMAX® BASIC / CLASSIC
- Plug-in
- Winter operation and sludge removal mode for the reduction of the aeration times

General information on operation

The operation of the control unit takes place via three short-stroke keys. By pressing a key the display illumination is switched on (lapses if no key is operated within 5 minutes).

Key functions:

↑↓ Scroll upwards or downwards / menu selection

OK Transition of cursor to the character, which is to be changed / value input is saved / selection of menu point / menu setback.

With temperatures below 0°C a severely limited function of the LC display is to be anticipated.

The ATB*control*© 3 is supplied as plug-in variant. Cabling on site is dispensed with.

All tasks, which nevertheless require an opening of the control unit, are to be carried out by a qualified electrician!

ATTENTION! Before opening the ATB*control*© 3 and/or the connection box it/they must be disconnected from the mains supply. Work on opened units may be carried out exclusively by qualified electricians! Pay attention to phase-correct connection (even with plug-in design)!

As you are concerned with an electrical plant with submerged motor units, a separate B16 fuse and a (separate) upstream 30 mA ELCB (earth leakage circuit breaker) is absolutely essential!
Attention is to be paid to correct laying of the protective earth conductor up to the earthing of the building.

Commissioning

With first commissioning basic settings and tests are carried out. Please ensure that all information for this is available. With input of the plant values all important parameters are pre-set. However, we recommend that, following commissioning, the parameters are again checked under `Settings`, as false values can, inter alia, lead to an increased power consumption.
In the `Service Mode` you have the possibility later of undertaking modifications.

Language selection

Enter language you need.

Password input

Please enter the six-figure code number.

Date and time

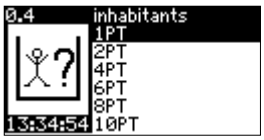
Enter the date and time.

Important for the correct entries in the logb

Selection of the plant type

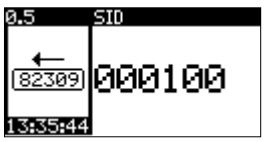
Select between BASIC or CLASSIC.

Number of inhabitants



Select the connected PT.
The settings belonging to the number of inhabitants are carried out automatically.

Serial number



Enter the serial number, which is located on the frame of the AQUAMAX® (not the serial number of the control unit), here. Please ensure that the serial number is entered right-aligned, in order that leading zeros result.

New plant?

With yes the sludge return feed is suppressed for half a year (run-in phase).

Test run

In test run operation the current float level and the current power input are indicated. Pressing OK carries out the test run.

With this make absolutely sure that no one is working in the danger area of the running submerged aerator!

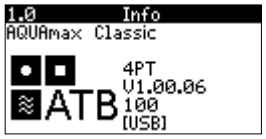
The individual units are taken into operation for 4 seconds and are checked for overload and/or underload. If the minimum permitted value is undercut or the maximum permitted value is exceeded a warning signal results.
By manual switching of the float switch (BASIC: submerging in or removing from the water) the test run can be repeated and concluded.

The test run can be interrupted through OK.

Saving of the parameters

Have you made an incorrect input? By selecting no and OK the commissioning can be repeated.
If the inputs are correct, confirm with yes and OK.

Info indication / Current phase



A switchover to info indication now takes place. Indicated is the plant type, the selected PT number, the software version and serial number of the wastewater treatment plant type.

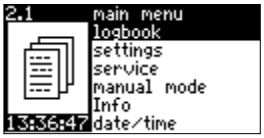
With this commissioning is completed. Should in the course of time a necessity for an amendment to the settings arise, then the specialists have the possibility of undertaking this in the Service Mode.

The current phase is indicated after ca. 5 minutes. By pressing ↑↓ you, however, have the possibility of changing over again to info indication or to the main level.
The indication of the current phase informs you about the current status of the wastewater treatment plant. Indicated are the operating hours of the individual units, the current cycle phase and its duration as well as the time. In the case of malfunction, in addition, the fault which has occurred is indicated. By a single pressing of any key the background lighting is activated lapses 5 minutes after the last operation of a key).

Main Level

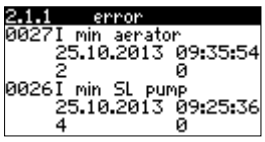
In the main level you have the possibility, using OK, ↑↓ and OK again, of accessing various sub-menus, which enables the acquisition of further information, amendment of settings or moving into manual operation.
You leave the main level through ↑↓ until the point `Return` and OK.

Logbook



All relevant errors, run times, events and messages are lodged in the logbook.
You access the individual points using ↑↓ and OK.

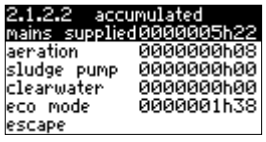
Errors



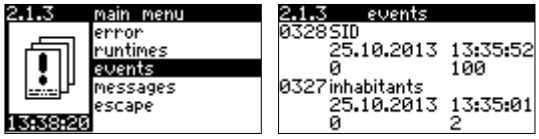
Recording of the error messages which have arisen (max. 1000). An explanation of the indicated messages can be found in the appendix. Return using OK.

Run times

You can have the run times shown in a weekly summary and over the complete operating time.

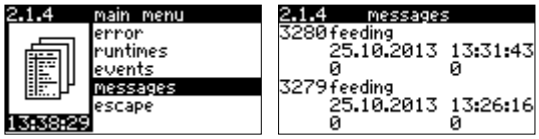


Events



Documentation of manual interventions (max. 1000). E.g. Changes of run times.
Return using OK.

Messages

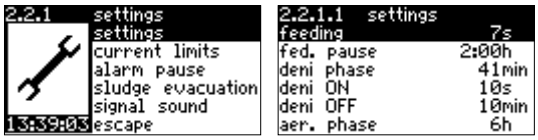


Every change of status is documented here; e.g. when the float switch has switched, when the compressor has switched on and off (also whether automatically or manually), failure of the mains supply voltage.

Settings

All relevant settings can be reviewed here.
Modifications are, with the exception of the confirmation of a sludge removal and of the signal tone, are possible in the Service Mode.

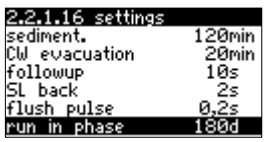
Operating parameters



`feeding`: specification of the feeding time (with the BASIC the number of charging batches) for the build-up of the communicating pipe between coarse filter and sludge activation.

`fed. pause`: Time period between batches.

`Deni phase`: Duration of the denitrification phase. The denitrification phase is component part of the aeration phase and takes place following the charging.



`Deni aer. ON/OFF`: Aeration times/pauses during the denitrification phase.

`Aer. phase`: Duration of the complete charging phase.

`ON/Off norm`: Aeration times/pauses during the normal phase.

`Aer. ON/OFF econ`: Aeration times/pauses during the economy phase.

`sediment.`: Duration of the settling phase.

`CW evacuation`: If the removal of the clarified water at the end of the settling phase takes longer than the run time specified a flooding warning takes place.

`followup`: In order to prevent a "wrong" level signal accidentally caused by water movements after reaching the actual float switch-off

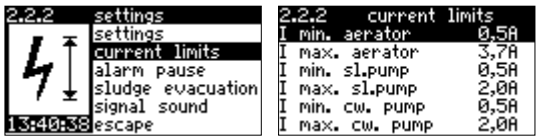
point, a follow-up time can be entered.

Sl back: Time for the excess sludge removal. This takes place once during a cycle, immediately following an aeration.

Flush pulse: In order to free the clarified water pump of activated sludge, which has collected in the casing during the aeration phase, the pump is operated during the settling phase for the time set (with the BASIC the number of the charging batches). Through the short-term build-up of a head of water and the subsequent subsidence, the sludge is driven out of the casing.

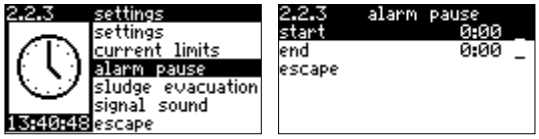
run-in phase: During the listed number of days no excess sludge removal takes place.

Current limits



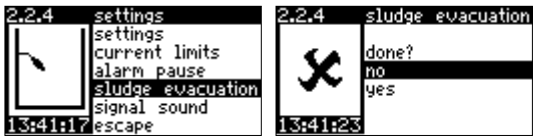
Minimum/maximum current consumption of the individual units below/above which an alarm signal takes place.

Alarm pause



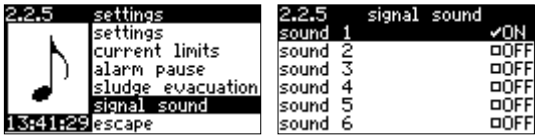
If errors occur within the selected time interval (max. 12 hours), then the acoustic alarm is emitted only after run-out of this time.

Sludge evacuation



With activation the aeration times are reduced by 20% for a period of six weeks (no further reduction in winter operation).
Following successful activation this function is blocked for six months.

Signal sound



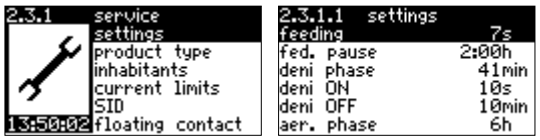
Selection of the volume of the alarm sound.

Service mode

The access to the Service Mode takes place via a 6-figure code number, which is made available exclusively to the authorised specialist firm.
In the Service Mode all parameters relevant and necessary for the operation of the wastewater treatment plant are set and changed. Please note that false inputs can lead to a faulty process!

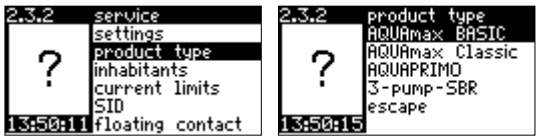
The inputs are not checked for plausibility! ATB WATER GmbH rejects any claims under warranty for the results of inappropriate inputs!
Our service department will be very happy to provide you with support.

Operating parameters



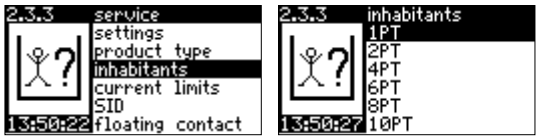
With the selection of the PT number with commissioning, the parameters lodged in the memory are loaded. At this point you have the chance of carrying out modifications. For description of the individual points see above (Settings).

Product type



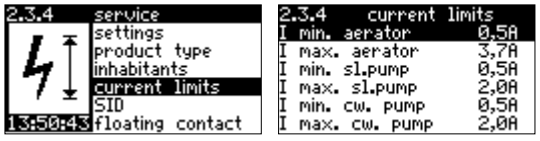
Selection of the product type.

Inhabitants



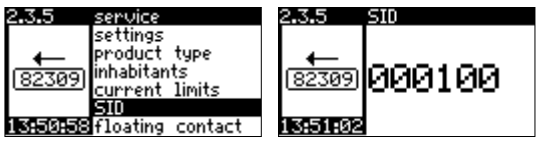
Selection of the connected inhabitants. The associated parameter values are loaded automatically.

Current Limits



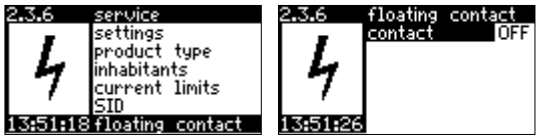
Minimum/maximum current consumption of the individual units below/above which an alarm signal takes place.

Serial number



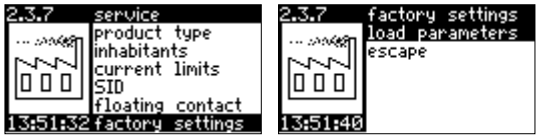
Possibility of correction of the serial number, which is located on the AQUAMAX®-frame (not the serial number of the control unit!).
Please ensure that the serial number is entered right-aligned, in order that leading zeros result.

Floating contact



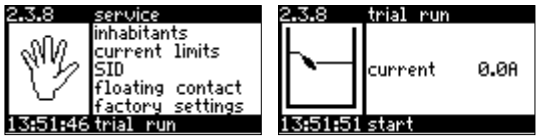
Activation/deactivation of the floating contact (Standard: deactivated).

Factory settings



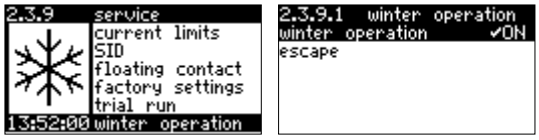
All parameters are set back to the values for the selected plant type and the population figure.

Test run



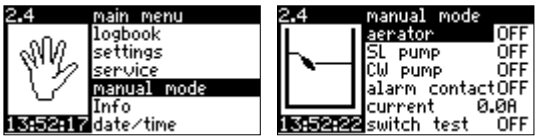
Mode of operation s. Commissioning.

Winter operation



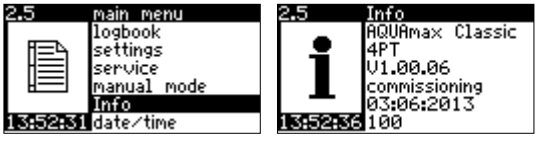
Activation/deactivation of the winter operation (Standard: activated).
With the activation the aeration times in the months December, January and February are reduced by 20% (no further reduction following activated sludge removal).

Manual mode



In the manual mode the individual units can be commissioned manually and the function of the potential-free contact can be checked.
With the changeover to manual operation the normal programme sequence is maintained (all units = OFF) and following ending of the manual operation is continued at the respective point.
Indicated are the position of the float switch and the actual current consumption.

Info



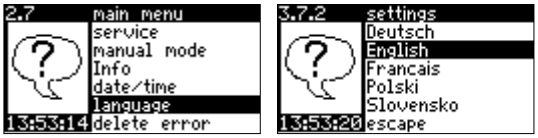
Under this point you can call up the details for the selected type, the PT value set, the version number and the date of commissioning.

Date / Time

Possibility for input / correction for date and time.

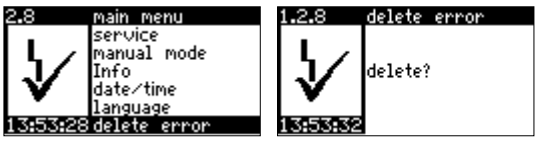
Important for the correct entries in the logbook!

Language



Possibility of modifying the language settings.

Delete error



Following acknowledgement of an error message this, with a renewed occurrence over a period of 72 hours, is suppressed.
If this is not wanted, i.e. the error should be reported immediately with the next occurrence, press OK.

Pre-set Parameters

	Charging			Denitrification			Aeration phase	Normal operation		Economy mode	
Type	BASIC	CLASSIC			Aeration			Aeration		Aeration	
[PT]	No.	Duration	Pause	Duration	ON	OFF		ON	OFF	ON	OFF
		[sec]	[h]	[min]	[sec]	[min]	[h]	[min:sec]		[min:sec]	
min / max[1]	4/10	4/30	1.5 /[2]	10/90	5/60	5/20	3/22	0:30 / 15	7:30 / 20	0:30/15	7:30/20
1	5	7	2,0	41	10	10	6,0	00:30	07:30	00:30	07:30
2								00:30		00:30	
4								00:42		00:30	
6								00:48		00:30	
8								01:00		00:30	
10								01:18		00:39	
12								01:36		00:48	
16								01:54		00:57	
20								01:00		00:30	
24								01:12		00:36	
28								01:24		00:42	
32								01:36		00:48	
36								01:48		00:54	
40								01:54		01:00	
44								02:18		01:06	
48								02:30		01:12	
50								02:42		01:18	
60**		5		30				10:00		05:00	
75**		6						15:00		07:30	

	Settling phase	Water removal	Run-on time		Sludge removal		Flushing surge		Energy consumption[3]	
Type			BASIC	CLASSIC	BASIC	CLASSIC	BASIC	CLASSIC	BASIC / CLASSIC	ZB
[PT]					No.					
	[min]	[min]	[sec]	[sec]		[sec]	[sec]	[sec]	[kWh/a]	
min / max[1]	60/120	10/120	0/120	0/120	0/30	0/90	0.2/1.0	0.2/0.5		
1	120	20	30	10	0	0	0,5	0,2	195	58
2		20			1	1			202	65
4		20			2	2			270	85
6		20			3	3			311	102
8		20			4	4			379	123
10		20			5	5			436	142
12		22			6	6			522	165
16		29			8	8			622	201
20		36				10			755	258
24		43				12			818	290
28		50				13			943	332
32		58				15			1068	374
36		65				17			1192	565
40		72				19			1268	607
44		80				21			1374	659
48		86				23			1462	706
50		90				24			1561	746
60**	90	20		0		24				885
75**		25				24				1101

[1]Minimum or maximum possible input values

[2]The maximum time corresponds to the specified time of the aeration phase.

[3]With standard conditions. These values can, in practice, vary by +/- 10%.

The setting of the control system takes place to the above details. The table is saved in the control unit; a manual input of the individual values is not necessary and at this point serves solely for checking.

**** For the ZB variants (pressure aeration), the parameters for 60 and 75 PE must be entered manually!**

Current Limiting Values**

<table>
<tr><td>Type</td><td>Aerator</td><td>Compressor</td><td>Charging pump</td><td>Clar. water pump</td></tr>
<tr><td></td><td></td><td>ZB-version**</td><td colspan="2"></td></tr>
<tr><td>[EW]</td><td>[A]</td><td>[A]</td><td>[A]</td><td>[A]</td></tr>
<tr><td>min/max</td><td>0 / 6,5</td><td>0 / 6,5</td><td>0 / 6,5</td><td>0 / 6,5</td></tr>
<tr><td>1
2
4
6
8
10
12
16</td><td rowspan="8">0,5 ... 3,7</td><td rowspan="8">Quarter-/ Half chamber
0,2 … 0,6

Full chamber
0,3 … 0,9</td><td colspan="2" rowspan="16">0,5 ... 2,0</td></tr>
<tr><td>20
24
28
32</td><td rowspan="8">1,3 ... 6,3
(CLASSIC only)</td><td rowspan="4">0,6 … 2,0</td></tr>
<tr><td>36
40
44
48
50</td><td rowspan="5">1,2 … 4,0</td></tr>
<tr><td>60**
75**</td><td>1,6 … 5,0</td></tr>
</table>

**** For the ZB variants (pressure aeration), the current limiting values for the compressor must be entered manually (for 60 and 75 PE also for the pumps)!**

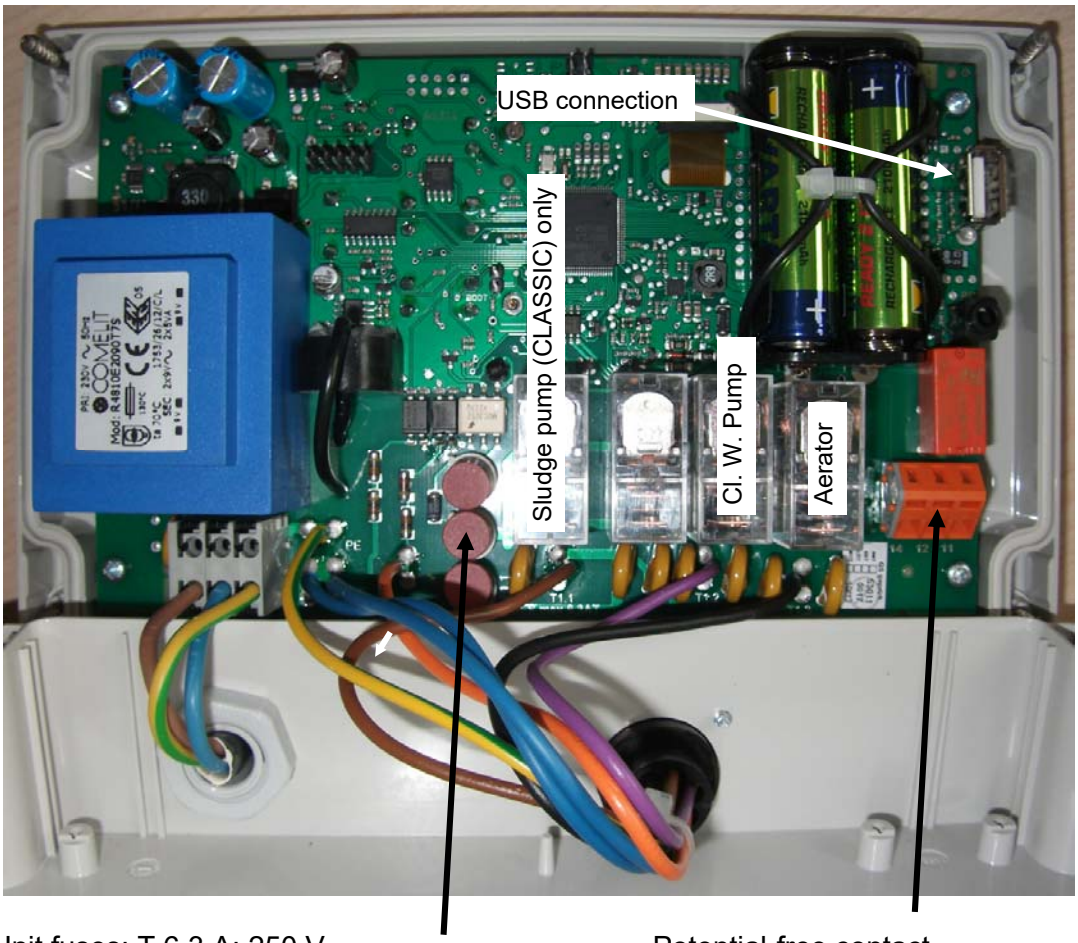
Error Messages

"Current min"	The minimum permitted current of the respective unit is undercut for longer than 5 seconds following switching OFF of the unit. The value of the current, which is measured, is saved as environmental condition.
"Current max"	The maximum permitted current of the respective unit is exceeded for longer than 5 seconds following switching ON of the Unit. The value of the current, which is measured, is saved as environmental condition.
"Flooding"	A flooding alarm is identified as, despite the maximum, activation time of the clarified water pump, no change of the float has been identified.
"Float supply"	For the measurement of the float level, the float is supplied with a separate voltage, which is used for diagnosis. An error “Float supply” leads to the generation of a default value “Float up”, i.e. the processes run in normal mode with cyclical flooding alarm as pseudo error.

UVS® (Under Voltage Signalling / Voltage failure detection)

The UVS® simplifies the safeguarding of an efficient operation. If there is a power failure (supply voltage < 100 V), e.g. through the activation of the residual current circuit breaker (RCCB) or a fuse, an acoustic alarm is initiated. The pulse tone continues, depending on the charged status of the accumulator, for up to 24 hrs. The signal is deactivated by pressing any key or as soon as a sufficiently high voltage is generated. Adjustments do not have to be undertaken. A power failure is recorded in the logbook.

ATB*control*© 3 – Control Circuit Board

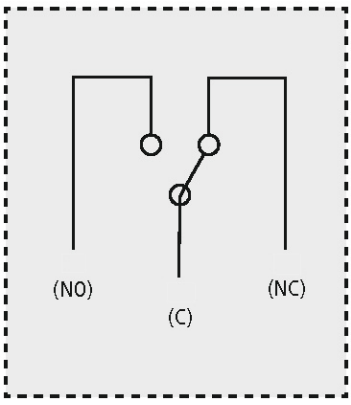


Unit fuses: T 6.3 A; 250 V
Potential-free contact
(1.1) Sludge pump, (1.2) Clarified water pump, (1.3) Aerator

Fuses
The control system has three socketed insert fuses of the TR5 type. The fuses can be exchange using needle-nosed pliers.

Should an exchange of fuses be necessary the control unit MUST be disconnected from the mains beforehand!

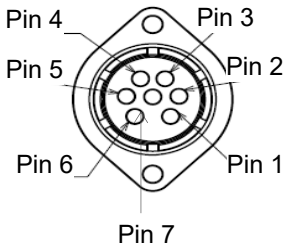
Potential-free Contact
The control system has a contact, which is designed as changeover contact, e.g. for the connection of an external signal transmitter. To connect the contact please carefully break out the pre-stamping in the casing and lead the cable through a suitable M16 threaded connection in order to maintain the degree of protection of the casing.
The contact functions as break contact (opener) to the terminals 11 and 12 (with activated fault indication).



11 - C (common): common lead
12 - NC (normally closed): break contact
14 - NO (normally open): closing contact

Configuration of the Connection Socket (Plan view casing exterior)

Pin plug	Colour	Solder joint	AC/ DC	Function CLASSIC	Function BASIC
1	Blue	N	230V AC	Neutral lead (Mains)	Neutral lead (Mains)
2	Black	T1.3	230V AC	Phase aerator	Phase aerator
3	Brown	T1.1	230V AC	Phase sludge pump	Neutral clarified water pump
4	Violet	T1.2	230V AC	Phase clarified water pump	Phase clarified water pump
5	Orange	IN1	12V DC	Float 12V feed	Float 12V feed
6	White (blue)	N	12V DC	Float return	Float return
7	Yellow/ green	PE	PE	PE earth conductor	PE earth conductor



USB Connection
You have the possibility of reading the logbook data via the USB connection (e.g. using USB stick). For this, open the control unit and insert the USB stick in the socket provided.

ATTENTION! Voltage carrying component. Implementation by qualified personnel only!

If the unit is ready there is an acoustic signal. The info window must be visible in the display.

Press the ▲ and OK keys simultaneously. A renewed acoustic signal indicates the successful transfer of data. The data can be read subsequently as an Excel file.

ATB*control*© 3 – Technical data

Casing

Material:	ABS with CR sealing material
Type of protection:	IP 54
Dimensions:	205 x 150 x 70 mm (W x H x D), incl. fixing attachments and screwed connections

Power supply

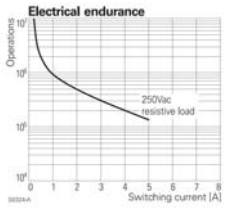
Input voltage :	230VAC, 50/60 Hz ± 10%
Overvoltage protection:	300 V AC
Input fuse:	PTC (thermal fuse activates at 130°C, not resettable)
Power consumption:	type 2.0W (with unilluminated display and potential-free contact switched OFF)

Inputs

1 Digital input:	230V AC, opto-decoupled

Outputs

Output voltage:	230 V AC, 50/60 Hz ± 10%
Nominal load current:	16.0 A (contact rating), ohmic load
Output fuse:	T 6.3 A (max. !)



Potential-free contact

Contact voltage:	250 V AC / 30 V DC
Contact rating:	5A, ohmic load

Temperature range

Equipment function:	0°C to +50°C
Display indicator:	0°C to +50°C

Accumulators: 2xNiMH, 1.2V, Type AA, 2,100 mAH; Service life: 1000 charge/discharge cycles

with trickle charge: min. 6 years $|_{25°}$

with trickle charge: min. 3 years $|_{45°}$

ATTENTION!
It is recommended to have the accumulators exchanged every two years by an authorised specialist firm.
The exchange of the accumulators with batteries is forbidden due to the danger of explosion!

Information on Routine Maintenance

With routine maintenance tasks and examinations must be carried out by service personnel at greater intervals. Numbers of and requirements on the routine maintenance are specified by the lower water authorities, whereby with this the biological effectiveness is at the forefront. The plant is equipped with a UVS®. As a rule, a twice a year routine maintenance is sufficient. The examination of the treated wastewater with regard to the different parameters is also specified by the lower water authority.

We recommend at least the following tasks are carried out:

- Inspection of operating logbook or of the electrical logbook and reading of the operating hours meter with determination of regular operation (target-performance comparison).
- Extraction of AQUAMAX® and removal, if necessary, of existing braids or similar in the units
- Functional check of the operationally important mechanical, electrical and other plant components such as aerator, pump(s), float switch and control unit.
- Functional check of the roof (overhead) ventilation.
- Adjustment of optimum operating values, e.g. oxygen supply (~ 2 mg/l), sludge volume (300-500 ml/l).
- Determination of the height of the sludge level in the sludge storage and, if required, arrangement of sludge removal.
- Carrying out of general cleaning tasks such as, for example, removal of deposits, removal of foreign bodies.
- Examination of the structural condition of the plant, e.g. corrosion, accessibility, ventilation, screwed couplings, hoses.

Task firms for the implementation of routine maintenance, whose employees hold proof of technical qualification and who have been trained by ATB.
The routine maintenance carried out is to be noted in the operations diary.

At least the following wastewater examinations should be carried out on the discharge within the scope of the routine maintenance:

Investigation of a random sample of the discharge (sampling container) for:	Investigations in the aeration tank:
• COD • NH_4-N (Discharge Classes N + D) • $N_{tot, anorg.}$ (Discharge Class D) • pH • Suspended solids	• Oxygen concentration • Sludge volume • Temperature

If the sample is taken out of the sampling bottle, this should previously have been allowed to stand for at least 15 minutes. Under no circumstances shake! Through this a possible growth on the bottle wall can be detached and falsify the analysis results.

The sampling bottle is to be cleaned at the end of routine maintenance or exchanged for a clean one.

The findings and tasks carried out must be documented in the routine maintenance report. This is handed over or sent to the operator of the wastewater treatment plant with the results of the water sample. The responsible water authority can demand sight in the operations diary and the routine maintenance reports. Frequently, the lower water authorities demand the sending of the maintenance report by the operator or maintenance firm, after each routine maintenance.

Rectification of Faults

Fault	Possible cause	Rectification
The water level in the primary settling stage is unusually high, whereby a normal water level is present in the aeration stage.	• The charging pipeline is leaking and draws in air.	• Check the screw connection for tightness. If a hose is available as charging line the securing of the hose and the leak tightness of the hose should be checked.
	• The charging pipeline is blocked.	• The water transmissibility can be checked in manual operation.
	• The submersible motor pump is defective.	• Call the Service.
	• There is air in the impeller chamber of the pump. This condition can be detected through a gurgling sound. The bleeding of this chamber is ensured through a small drilling in the lower third of the pump casing.	• Remove AQUAMAX® and check the drilling, if required, clean.
The water level in the primary settling stage and in the aeration stage is unusually high. The control system indicates “Flooding alarm”.	• Unusually high infiltration water inflow. With heavy rainfall due to surface water or rain-sodden ground due to leaking concrete tank.	• Infiltration water may not ingress into the wastewater treatment plant over a longer period. If necessary, seal concrete tank or remedy other causes.
	• The submersible motor pump is blocked or defective.	• Check the pump with manual operation, if required, call Service.
	• There is a back-up at the discharge point. The water conveyed by the pump flows back again.	• The discharge point must be made free again.
The water level in the primary settling stage and in the aeration stage is unusually high. The control system indicates “Energy-saving operation”.	• The float switch cannot float up because it is limited its freedom of movement.	• Check the float switch (see Manual Mode).→Does not apply for BASIC.
	• The float switch is defective or the cable is interrupted.	• Call Service.
The water levels in the primary settling stage and in the aeration stage are always the same, although water flows into the primary settling stage.	• The partition wall between aeration stage and primary settling stage is not watertight.	• Close partition wall slits and, if necessary, reseal partition wall joints.
	• The hydraulic system in the AQUAMAX® for the interruption of the charging pipeline is impaired.	• Call Service.

Fault	Possible cause	Rectification
There is no indication on the control display.	• The plant is without power.	• Check pre-fusing and/or residual current circuit breaker.
	• The display is defective.	• Call Service.
Acoustic alarm sounds. There is no indication on the control display.	• The plant is without power. UVS® has triggered.	• Check pre-fusing and/or residual current circuit breaker.
	• The display is defective.	• Call Service.
“Fault” with the description of the electrical unit involved appears on the display.	• The unit or the complete AQUAMAX® is not connected with the control system.	• Connect the appropriate unit.
	• A screw terminal in the cable distribution box or on the terminal strip of the control unit is not correctly tightened, so that the connection is interrupted.	• Have the contact points and the cabling checked by an electrician.
	• The connection cable from the electrical unit to the control box is interrupted.	• Defect rectification see above.
	• The fine fuse of the corresponding unit has triggered.	• Change fuse.
	• The water level in the aeration stage is so low that the pump runs dry.	• Defect rectification see above.
	• The corresponding unit is blocked or runs rough (check power consumption).	• Remove AQUAMAX® clear blockages.
	• The corresponding electrical unit is defective.	• Call Service.

Fault	Possible cause	Rectification
The treatment performance of the plant is unsatisfactory.	Most of the above given defects can lead to a reduction in treatment performance. In addition, there can be many reasons given for unsatisfactory discharge values, such as: • insufficient oxygen supply • Faulty position of the submersible aerator • leaking of the tank • discharge of large quantities of detergents or disinfectants as well as other non-permitted substances • (paints, solvents, etc.) • sludge disposal not carried out • faulty settings of the population figures • plant disconnected from the power supply for longer period	In the interests of the environment you should get in contact with your service operation in order to achieve an improvement in the discharge values.

Important data for the fault diagnosis of the electrical units (All units 230 V AC)

Submersible aerator	R_{Ha} [Ω]	I_{Load} [A]	P [kW]
AQUA 3	32	1.3	0.27
AQUA 5	14	2.5	0.56
AQUA 200 SV	27	1.1	0.35

Submersible motor pumps			
ATB*lift* 1	32	1.1	0.25
ATB*lift* 2	32	1.25	0.30
NOVA 180 SV	46	0.9	0.24
NOVA 200 SV	27	1.5	0.35
FEKA 600	8	4.3	1.0

Declaration of EC-conformity

The manufacturer:	**ATB WATER GmbH** **Südstr. 2** **D-32457 Porta Westfalica**
declares herewith, that the following specified product:	**AQUAMAX®**
implements the requests of following EC-Directives: plus EU-edict	2006/42/EG Directive on machinery 2014/30/EU Directive to electromagnetic compatibility 2014/35/EU Directive to electrical equipment designed for use within certain voltage limits 305/2011 Construction products Regulation

Modifications in the construction, which have consequences to technical specifications and the handling in according to regulations, cancel this declaration of conformity!

Porta Westfalica, 04.04.2018 Markus Baumann (Managing Director)

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