

Made in Germany

User manual version 1.2

Version 1.2 of this manual describes the current product release; Changes in terms of technical progress are reserved and will be applied without further notice.

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Introduction

We thank you for putting your trust into us and purchasing our fully automated water treatment plant. This manual provides information for installing and operating the plant, which allows generating fresh water on yachts, house boats, RVs and vacation homes. Please read all chapters of this manual very carefully before beginning installation or start-up. Correct installation of this plant requires technical personnel, preferably acquainted with plumbing, and respective tools.

Please contact us if you have any doubts or uncertainties during installation!!

Warranty claims caused by incorrect installation will not be considered. Pay close attention to all given warning notices.

We recommend using our installation service in case of doubt.

System description

aqounic is a fully automated water treatment plant, used for turning lake or river water into tap and fresh water onboard. The plant is controlled by an automated control unit with no user input required. Furthermore, rain or well water can be treated by the plant.

A prepump sucks in the water through a filter, which will then be pushed through an osmosis diaphragm by a high pressure pump. The resulting waste water containing the filtered material will be diverted overboard, or can be used for flushing the WC instead. The produced fresh water will be further purified by an UVC sterilization unit and remineralized. This procedure ensures clean and sapid water in the fresh water tank.

The plant's functions and cleaning capacities must be checked regularly (see chapter MAINTENANCE).

This manual must be fully read and understood before using the plant.

Test

All parts of the plant are individually CE-certified and the plant itself is manufactured CE compliant. The cleaning capacity was tested according to the rules of the German Drinking Water Ordinance. **aqounic** was intensively tested to prove its cleaning capacity. These tests included all natural and agricultural poisonous and harmful substances among other things.

Despite all effort, we cannot guarantee that heavily polluted water such as in industrial ports or near intense agriculture will be 100% cleansed. The plant's operator is responsible for monitoring the cleaning capacity and changing the plant's filters and diaphragm if needed. Furthermore, the operator must ensure periodic use of the rinse cycle and may need to inspect the produced water in

case of doubt. There are special test sets or certified test laboratories (for commercial use) for the latter.

Safety indications

Please pay close attention to following safety indications:



This symbol refers to outstanding hazard sources.



This symbol refers to outstanding electrical hazards.

This plant may only be installed and operated if you read and understood all given instructions of this manual. Improper installation or operation may cause serious damage which may not be covered by our warranty or product liability.

Checking delivery

Please check the delivery immediately upon receipt and make sure that all parts on the shipping note are present and not damaged.



In case of visible damage, document the type of damage **together** with the deliveryman (parcel service, shipping company) and report the damage **immediately** to us. Damaged parts need to be replaced and may not be used for installation. Missing parts need to be reported immediately. **Do not dispose of the packaging until the plant is installed and fully functional.**

Scope of delivery

- Plant in 12 or 24 Volt as ordered
- Remote control switch with cable length as ordered
- Pre-pump in 12 or 24 Volt with cable of 5m
- Pump pre-filter
- 5 m fresh water pressure line 3/8"
- Adapter clips

Following accessories and consumables may be delivered on demand:

- 16 mm spiral reinforced inlet hose
- 3/4" Truedesign Seacock with black through-hull fitting
- white through-hull fitting as tap water outlet and overflow
- 3/8" fresh water pressure line (needed for connecting plant to tank, plant to outlet and as flushing pipe)
- Voltage cable and remote control cable in any desired length
- Fuse
- Power supply 24 V
- Connection fittings for fresh water pressure line to flushing pipe (1/2 or 3/8", most faucet connections use 3/8", the pump connections of the onboard pressure pump also uses 1/2", please order the appropriate parts)
- Screw-in fittings suitable for water tanks made of plastic
- Replacement filter set
- Replacement diaphragm set



All accessories will be provided and charged according to use if you ordered our installation service. You may save shipping costs by ordering a complete set of accessories and consumables in case of self installation.

Basics

Application and intended use

Our water treatment plant is used for turning surrounding water into the clean and sterile fresh water. The plant can use water from rivers, lakes, wells or plain rainwater, but is incapable of desalinating sea water. The latter requires one of our desalination plants.

It is imperative to only use the plant for its intended purpose and to avoid water that is full of chemicals to ensure safe operation of the plant; chemicals or oil in the water may congest the filters or diaphragm; furthermore, the purity of the produced fresh water will not be guaranteed.



The plant's diaphragm used for osmosis are easily congested or damaged by chlorine, oil or chemicals. It is therefore important to avoid using contaminated water like around industrial ports.

Functional principle

Surrounding water will be sucked through a filter unit consisting of four prefilters (sediment, 20 µm, 5 µm, carbon filter) and then pressed to the osmosis diaphragm by a high pressure pump for further cleaning. The resulting waste water may be reused or diverted off board. The produced fresh water will further be purified by an UVC sterilization unit and remineralized. The water circulation is controlled automatically by magnetic valves. The plant will begin a flushing procedure upon start and will therefore divert the produced water off board for the first 15 minutes.



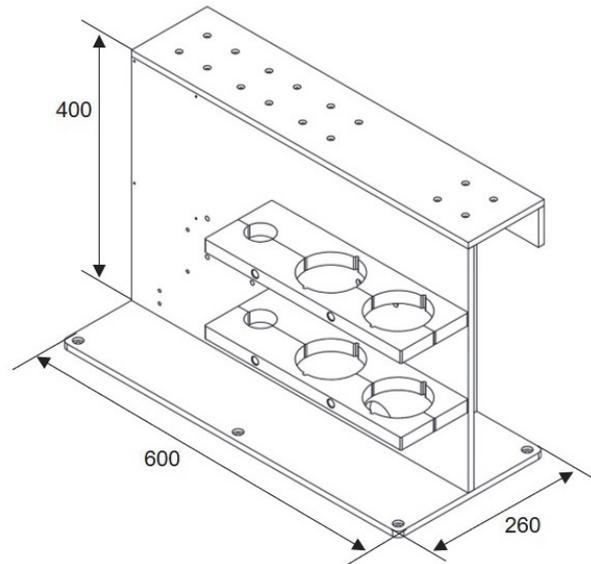
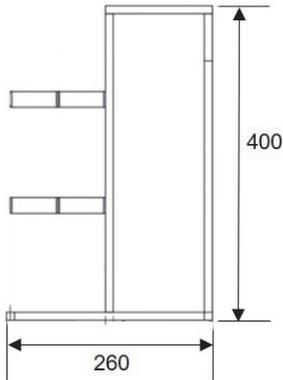
The generated waste water and the water used for cleaning during the first 15 minutes will be diverted through the water line to the connected overflow (min ID 10 mm). The plant shuts off automatically in case of overpressure (e.g. if the diaphragm is congested). Please refer to chapter ERROR MESSAGES for further information.

Technical data

Day/hour fresh water capacity:	max 2,880 l/d or 120 l/h respectively
Weight of the plant:	20 kg
Total weight after installation:	27 kg
Length:	600 mm (clear length 620 mm)
Width:	260 mm (clear width 280 mm)
Height:	400 mm (clear height 420 mm)
Casing:	PEHD (framework) PVC (valves and pipes)

Approval according to:

CE; 89/392 CEE sect.1 (general safety machines requirements), 89/336 CEE (electromagnetic compatibility), 73/23 CEE (electric safety requirements); valves and pipes according to drinking water ordinance



Control electronics

- Fully encapsulated installation casing with attached control cable and remote control switch

Remote control

For easier operation of the plant, we provide a remote control switch with a control cable of 5m length (standard length, extensions are possible).



The control cable for the remote control can be arbitrary extended; Please tell us the desired cable length **before delivery** (standard length is 5m).

Plant assembly

Choosing assembly site

The plant should be installed low and as close to the inlet valve as possible to ensure an unobstructed supply of water. Furthermore, the prefilter and inlet valve should be close to the plant. If the plant cannot be installed below the water level, the prepump must be placed next to the inlet valve.



We deliver a separate prepump by default – the maximum distance between inlet and plant is 3m in height and 5m in length.



The plant is not frost-proof and must therefore be installed in a frost-proof place off the vessel or vehicle. If there is no appropriate place, the plant must be equipped with an extra heating system or be shut down and winterized during winter. Please refer to chapter SHUT DOWN for further information.



1. Inlet valve, we recommend TRUDESIGN plastic valves with ¾" ID (separatly deliverable; **not** within scope of delivery)
2. Sediment-prefilter (within scope of delivery)
3. Prepump (within scope of delivery)
4. Onboard fresh water tank; we recommend a capacity of at least 200L (separatly deliverable; **not** within scope of delivery)
5. Tap water tank or drainage; we recommend a capacity of at least 200L with overflow or 10 mm ID drainage (separatly deliverable; **not** within scope of delivery)
6. Flushing water inlet from the vessel's water supply (around 2-3 bar high pressure line required, branch off from cold water tap or water pressure pump ; installation material separatly deliverable; **not** within scope of delivery)

aquonic requires a solid horizontal base that can support 30kg for installation. Composite or plywood panels can be successfully used but need to be protected from wetness. The plant must be screwed on the panels to prevent movement while reeling?. The plant's pumps cause noise, so **aquonic** should not be installed below bunks that are used during daytime.

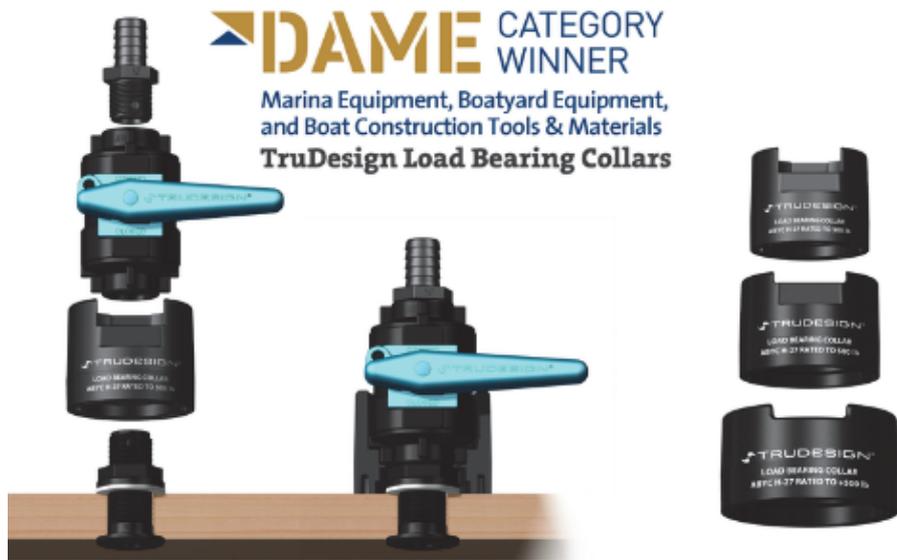
The assembly site should be easily accessible for maintenance and allow assembling the plant in one piece.

aquonic requires the following connections for operation:

- Inlet: 16 mm inside diameter, spiral reinforced hose
- Flushing water: 3/8" (9,5 mm) Fresh water line from the vessel's water supply
- Drainage: 3/8" (9,5 mm) Fresh water line offboard or collection tank
- Tank connections: 3/8" (9,5 mm) Fresh water line to the tank
- Supply voltage: The plants requires 12 V with a 20 Ampere fuse (delay) or 24 Volt with 10 Ampere Fuse respectively.



The water intake may be connected to a seacock built into the hull, which should be sized at least ¾", or to a hose that is submerged at least 50cm deep into the surrounding water. We recommend TRUDESIGN plastic valves which stay sealed and free of corrosion permanently. If the plant is going to be used while moving, an inlet strainer must be installed on the outside against the direction of travel to push the water inside. If not, quick movement will cause the lake water to stall and not be sucked in. Remember to close the seacock if it is not being used to avoid flooding in case of leaking hoses or pumps. Therefore, a gooseneck should be installed between the seacock and the pre pump above water level.



Please state your desired cable lengths between plant and remote control, hose lengths and the used supply voltage on board upon ordering.



Use sufficiently large cables (double insulated rubber cable) with adequate protection for on board power supply. The cross section needs to be at least 4 mm² for a 12 volt supply system on board or 2.5 mm² for a 24V system respectively. The plant should be connected to a buffer batterie instead of directly to the DC supply system because of the inrush currents of the pumps. Please request adequate configurations **beforehand**, if you do **not** use a 12 or 24V supply system on board. We deliver the appropriate power supply on demand.



The plant may only be connected if the battery main switch is set to off. The basics of electric wiring and safeguarding circuits are to be followed.

Making the connections

All hose connections must be secured twice with opposite hose clamps. The fresh water lines will be interlocked and with a lock ring secured. The hose should be wetted before connecting (dipping into a cup filled with a mixture of water and dishwashing agent, rinsing agent works too). Push the hose up against the inlet and insert the clip. For disconnecting, remove the blue clip and push the inlet towards the adapter and pull out the hose.

The electrical connection must be done with a protected live cable directly connected to the plant's socket. The cable markings are ALWAYS as follows (applies to the whole plant):

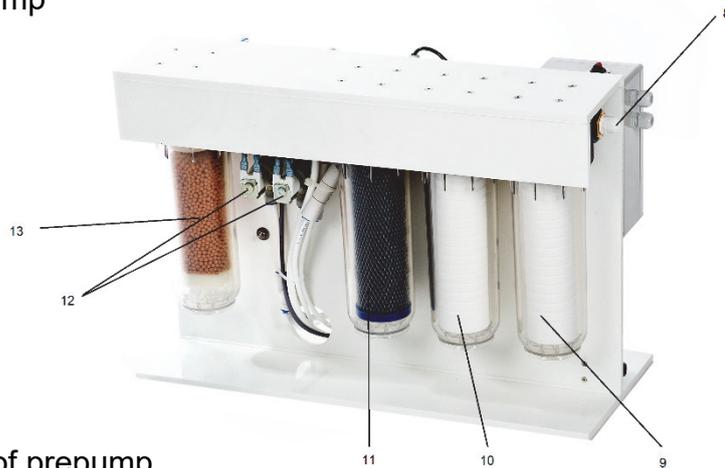
Cabel number 1	red	Plus	+
Cabel number 2	blue/black	Minus	-

Cabel number of remote control switch:

<i>cabel no.</i>	<i>contact switch</i>
1	13 and 23 (Bridge)
2	X2
3	14
4	24
5	X1



1. Multifunction switch for system control (remote control switch is default)
2. UVC-reactor
3. Fresh water outlet
4. Tap or waste water outlet
5. Diaphragm
6. Flushing valve
7. Pressure pump



8. Water inlet of prepump
9. 20 micron filter
10. 5 micron filter
11. Carbon filter
12. Switch valves
13. Remineralization

Installing the remote control switch

The remote switch requires a drilled hole of 22mm. The white switch unit can be removed by turning the selector level. Screw in the button and attach the switch in a way that turning the control button to the right will start the plant. Turn the switch unit by 180° if necessary. If the numbers are in upright orientation, all is ok.

Starting the plant and test run

The supply voltage may be attached if all connections are correctly in place. Now turn the selector left to start the rinse cycle, which causes the plant to be filled with water. Continue by checking all connections for leakage and the drainage off board. After 5 min the rinse cycle ends and the plant may be put into operation if no leakage was found. To start operating the plant, turn the switch to the right until the blue control lamps lights up. Check the pumps suction and make sure there is water running off board soon after starting. The pumps must not run dry for more than a minute.

System operation

aquonic's default mode of operation is the **AUTOMATIC** mode. Turning the selector slightly to the right (clockwise) starts the plant's rinse cycle (15 min). After that the plant begins filling the tank with fresh water.

After the rinse cycle the collection tank (fresh water tank of the vehicle) will be filled with fresh water.

The rinse cycle may be extended by turning the switch slightly to the right twice. This is recommended if the plant was not used for a long time.

Multifunction switch

AUTOMATIC MODE FRESH WATER PRODUCTION

Turning it slightly to the right (clockwise) will start the plant. The switch lights up if it is working properly. First, the rinse cycle will begin during which all water will flow overboard. Fresh water will be produced and directed to the tank once the rinsing procedure has ended. Turning it slightly to the right again several times extends the rinsing cycle by 15 min. This is recommended if the plant was not used for a long time.

STOPPING THE PLANT

Turning it slightly to the left stops the plant and initiates the rinse cycle. This causes the plant to be rinsed and filled with fresh water in order to avoid bacterial growth. The plant **cannot** be started again during the rinse cycle. Turning it slightly to the left

again several times extends the rinsing cycle by 5 min. This is recommended if the plant will not be used for a long time.

RINSE CYCLE

Turning the switch slightly to the left causes the plant to be rinsed with fresh water. This function is recommended **during** longer downtimes to flush out bacteria. The plant needs to be rinsed even if it is **not** in use and at least once every ten days. Alternatively, the diaphragm can be preserved, refer to chapter SHUT DOWN for further information.

WASHING

Turning it slightly to the right and then again once or twice will extend the washing time. This is used for polluted water in the inlet or after longer time of preservation.

Maintenance and monitoring

Responsibilities of the plant operator

As user of this plant, you are automatically considered the plant's operator and it is your responsibility that all maintenance and monitoring tasks are being performed. You need to carefully inform all guests on board about the plant's functions, uses and limits. If your yacht is piloted by others (guests or employees, skippers), you need to inform them about all functions and required maintenance tasks of the plant.

Changing filters

The filter system contains (from right to left) a 20 micron-, 5 micron- and carbon-1-micron filter as well as a remineralization cartridge. The filters need to be checked regularly and changed if polluted. The 20 micron filter needs to be changed most frequently, while the carbon filter and the remineralization cartridge are to be changed upon depletion. In front of the inlet pump is a sediment filter that withholds large amounts of dirt and must therefore be checked regularly and cleaned if necessary.

Diaphragm

The system uses special HighFlow-diaphragms that are designed for the required flow-rate and pressure. **Other diaphragms may not be used!!** The diaphragms must be changed if they get too polluted and at least once a year. Disconnect the two blue lock rings on the upper intake hoses, push the inlets inward and pull out the hoses to begin opening the diaphragm casing. Continue to open the casing with the

diaphragm wrench or any large pair of tongs and use it to pull out the old diaphragm through the white intake pipe and dispose of it. The thread pitch must then be carefully cleaned with a paper towel.

Push in the new diaphragm (black sealing ring up) as far as it will go and rub the lid's thread with the included Vaseline both on the inside and outside. Then screw in the lid and push in the hoses and secure them; wet the outside of the hoses for this.

UVC-sterilization

The purified fresh water will be channeled through a UVC-reactor for sterilisation to guarantee a high level of protection against bacteria and legionella. The UVC-reactor must be cleaned annually. To do this, turn off the plant, pull the protective cap with the lamp cable carefully up and remove the emitter with a soft piece of cloth. Next step is opening the union nut and extracting the reactor pipe. Clean the glass tube with the cloth if necessary. The emitter has a service life of 10,000 hours (equals more than 10 years of service with 2 hours of operation per day or roughly 900,000L fresh water). However, the emitter needs to be replaced if there are any dark spots visible to ensure full effectiveness.

Shut down

If you plan a long absence from the boat, someone needs to flush the plant every 10 days (the plant and the pressure pump of the ship's water supply must be activated for this). Alternatively, you can preserve the diaphragm by filling in a preserving agent. Disconnect the intake hose from the **closed** seacock and dip it into a bucket filled with a preserving solution. The overflow must be channeled to the bucket as well. Start the plant and let it run for 15 minutes, after which the plant must be stopped by cutting the power supply(do not use the STOP function or else the rinse cycle starts!!!). You can simply disconnect the fuse or toggle the on board main switch to achieve this. Now the plant is conserved for one year at most.

Winterising the plant

If the plant is not in use, it needs to be winterised in all regions with risk of frost. Use the same antifreeze as for the fresh water plant. Drain the plant and turn on the pump to flush all hoses with antifreeze. The filter and UVC casings need to be drained as well to avoid ice. Remove the emitter and unscrew the UVC casing to extract the glass tube.



Make sure that all hoses will be flushed with an adequate amount of correctly mixed antifreeze. Afterwards, the hoses need to be drained as much as possible. The procedure is similar to the preserving procedure.

An operating plant must be frost-proof and operated at 5°C minimum.

Inspecting cleaning capacity and functions of the plant

The plant's cleaning capacity must be inspected according to the following periods unless the water treatment is used commercially:

- **Daily** check of the plant for leakage, specifically the inlet side close to the valve
- **Every 10 days** the plant needs to be used or cleaned by manually starting the rinse cycle. The plant's parts need to be checked for leakage too.
- **Monthly** inspection of the pre filters (more often in case of heavily polluted water or excessive use)
- **Annual** inspection of all parts and hose connections for leakage and cleaning of the UVC reactor. Also make sure that all connections are firmly secured.
- **Annual** change of the diaphragm, more often in case of congestions or reduced production capacity.
- Changing the UVC emitter in case of dark spots or after 10 years – carefully pull out the cable connection and remove the emitter. Connect the plug and the new emitter before removing the protective tube made of cardboard, do not hold the new emitter with bare hands. Insert the emitter immediately after that.



Turn the plant off for changing the emitter to avoid accidentally turning on the UVC light. Do not look into the functioning emitter and never remove the protective cap if the plant is turned on. The UVC light is hazardous, especially for the eyes.

Trouble-shooting and error diagnostics

In all other cases contact our service line first to determine the possible cause of defect.

Warranty

For private use, we extend a two year warranty for the entire plant and all accessories we deliver. In case of commercial use, the warranty is reduced to one

year, each starting on the date of purchase. This warranty specifically covers no consumables like filter cartridges, Pump diaphragms etc..

Within the scope of this warranty we replace or repair broken or not correctly functioning parts of the plant to our discretion. Prerequisite is sending the affected parts to our storage after making a warranty claim. Contact us either via telephone or email:

Office: +49 33203 71501

eMail: info@tomlogisch.com

To not send back any plant or their parts without the proper postage or without contacting us first!!

Any other claims, especially based on improper assembly or operation and the consequential damage, are excluded.

Prerequisite for laying warranty claims is sending us following assembly and commissioning report immediately after initial operation.

Appendix

Commissioning report and briefings

A copy of the commissioning report must be sent to the manufacturer right after commission!!!

Plant model	Yacht model	Name of yacht
aquonic		
Fresh water tank (l)	Flag state	Assembly date
Assembler	Name of technician	Signature
Date of commissioning	Name of performer	Signature
Plant operator	Date	Signature
Briefed persons	Date	Signature

Maintenance report

Annual maintenance	Date	Signature
Filters/Pumps checked		
Water tightness checked		
UVC lamp checked or changed		
Diaphragm changed		
Annual maintenance	Date	Signature
Filters/Pumps checked		
Water tightness checked		
UVC lamp checked or changed		
Diaphragm changed		
Annual maintenance	Date	Signature
Filters/Pumps checked		
Water tightness checked		
UVC lamp checked or changed		
Diaphragm changed		
Annual maintenance	Date	Signature
Filters/Pumps checked		
Water tightness checked		
UVC lamp checked or changed		
Diaphragm changed		

Annual maintenance	Date	Signature
Filters/Pumps checked		
Water tightness checked		
UVC lamp checked or changed		
Diaphragm changed		
Annual maintenance	Date	Signature
Filters/Pumps checked		
Water tightness checked		
UVC lamp checked or changed		
Diaphragm changed		
Annual maintenance	Date	Signature
Filters/Pumps checked		
Water tightness checked		
UVC lamp checked or changed		
Diaphragm changed		
Annual maintenance	Date	Signature
Filters/Pumps checked		
Water tightness checked		
UVC lamp checked or changed		
Diaphragm changed		

Test Certificate

Test-Certificate

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Rodelberg 47, 14532 Kleinmachnow, Germany

Test of a Drinking and Fresh Water Treatment Plant for Yachts and Houseboats aquonic®

Test report PIA2018-TW02-LOG

Hydraulic Load		150l/h					
		11 Dec 2018		13 Dec 2018		17 Dec 2018	
1h - Test		In	Out	In	Out	In	Out
Analysis according to the German Drinking Water Ordinance		In	Out	In	Out	In	Out
Escherichia coli	[/100ml]	800	0	400	0	1,500	0
Enterococci	[/100ml]	1,200	0	200	0	3,200	0
P. aeruginosa	[/100ml]	70	0	10	0	10	0
Clostridium perfringens	[/100ml]	4,000	0	200	0	2,300	0
Coliform bacteria	[/100ml]	>10 ⁵	0	2,000	0	32,000	0
Colony count 22 °C	[/ml]	31,000	0	2,800	0	10,000	0
Colony count 36 °C	[/ml]	19,000	0	2,900	0	9,000	0

100% of the above given microbiological pollution in the test water was eliminated by the aquonic® Drinking and Fresh Water Treatment Plant.

Tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergentrather Weg 30
52074 Aachen



Dr. Martina Defrain December 2018/V01e

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