

**INSTALLATION AND USER GUIDE FOR  
DRUM FILTERS AND BIODRUMS**

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## 1. Preface

We thank you for the purchase of a drum filter or Bio-drum. This filter is a premium quality product with exceptionally high production-standards. This manual is intended to assist with the installation of the filter for usage and to advise you with regard to the necessary maintenance.

### **KEEP THIS MANUAL IN A SAFE PLACE! IF THIS PRODUCT CHANGES FROM OWNER, PASS ON THE COMPLETE MANUAL!**

In order to be able to enjoy this product for a long time, we recommend that you carefully read this manual and strictly follow the guidelines stipulated in this manual. If you are uncertain about the content of this manual, or do not entirely understand the assembly instructions, or if you are not sure about certain parts of the product, please contact the shop where you purchased this product.

The manual also informs you about possible hazards that may be caused by the filter. The user, the installer and the maintenance technician are responsible for observing and checking the procedures, as described in this manual. This filter was built in accordance with the existing safety regulations. However, this filter may cause risks for individuals and for real estate, if the filter is not used/installed professionally or is not being deployed for the purpose/use it was intended for, or if the safety regulations are ignored. If the filter is not deployed correctly, the manufacturer will accept no liability whatsoever. For reasons of safety, children and youngsters below the age of 16 years old, as well as people who are unable to recognise/estimate the possible risks involved in this product, or who are not familiar with this manual, are not permitted to use this device.

The combination of water and electricity may form an imminent threat to life and limb, if the filter is not being installed in accordance with the instructions or when the filter is being used incorrectly.

The general terms of Supplier apply to all products.

## 2. Shortcomings and claims for compensation, disclaimer

### **2.1 Shortcomings and claims for compensation**

Supplier can only be held liable in case the delivered goods show shortcomings at the time of delivery to the user. Small variations of the model/appearance that do not marginally influence the intended usage of the product, are excluded from this.

Warranty with regard to the usage and the suitability of an application, will only be accepted if they fall within the

We specifications specified in writing as, for instance, stated in this manual.

Any other verbal agreements, for instance during preparatory discussions, advertisement, etc., in relation to the product are valid only in case what was pledged is an integral part of a written agreement.

Only the terms and specifications stated by MPF will be valid. MPF will accept no terms and/or specifications from third parties. The specifications as set out in this manual, are prevailing.

If the customer wishes to use the product for purposes other than the intended purpose, they are obliged to thoroughly investigate the suitability for that particular other purpose. In any case, the customer will be entirely responsible and any liability will lapse if the product is not being used for the purpose intended by us, unless MPF expressly agrees to a specific other purpose, in writing. In case of modifications to this product, made by the user, the warranty will expire, as well as all claims and entitlements.

Every user is personally responsible for the correct usage or the filter. The manual does not exempt the user from the responsibility for safe application, correct installation, operation and maintenance.

By using this manual, you agree that the manufacturer cannot be held liable for any personal injury or material damage whatsoever, as a possible consequence of the usage of the filter. This applies for damage as a result of using inadequate pipes or connections in particular.

Damage resulting from insufficient cleaning or maintenance intervals are not covered by the warranty.

### **2.2**

The warranty for shortcomings is strictly limited to the additional efforts to remedy the shortcomings. This is the remedying of the shortcomings or the replacement of the parts that do not suffice, at the discretion of supplier. In case the shortcomings cannot be remedied or replacement parts cannot be supplied, the customer is entitled to cancel the purchase agreement.

It is stated explicitly that the warranty is limited to the filter itself. Supplier cannot be held liable for consequential damage (flood, loss of animals, etc.) due to non- functioning of the filter in whatever form, or as a result of a defect on or malfunction of the filter.

### **2.3**

The customer shall thoroughly inspect the goods immediately after delivery. (Apparent/possible) damage must be reported in writing. Hidden defects must be reported immediately after identification. The customer is

responsible for reporting any transport damage to the transporter and/or Supplier within 24 hours. The untimely checking and reporting of transport damage may lead to expiry of the warranty.

#### 2.4

Supplier is not responsible for the consequences of incorrect application, the use, maintenance and/or operation of the product by the customer, nor for normal wear. This applies to consequences of thermal, chemical, electro-chemical or electrical influences in particular, as also for failure to observe our user guide. The same applies for damage as a consequence of modifications or adjustments to the product which were not approved by supplier in advance.

#### 2.5

Damage that can be unambiguously attributed to incorrect usage of the product, is the responsibility of and for the account of the user. In case of returning of the product, the customer shall ensure proper packing and shipment free of breakage/damage. The customer himself is responsible for damage caused by inadequate packaging.

#### 2.6

Claims against supplier become barred within a year after delivery of the goods to the customer. The same applies to a claim for damage, regardless the legal cause. The period of limitation does not apply in case of concealment of damages, physical injury and other damage as a consequence of intent or deliberate negligence.

#### 2.7

If, during the investigation of the reported damage or during the repair of the failure/defect by us, it appears that the reported damage or claims were intentional or a result of negligence, we can charge a fee for the removal of the defects. The customer has the right to refuse a necessary repair and demand the return of the filter. In principle, every investigation is bound to a lump-sum indemnity if the customer himself is responsible for the damage.

#### 2.8 Replacement parts

The replacement parts will be available for a period of 5 years after the delivery of the product. Prices apply, as set out on the website of supplier.

#### 2.9 Reservation of changes

The manufacturer reserves the right to modify the product at all times without prior notification. No claims can be made if, e.g. the design, the functionality or performance of the filter is subject to modification. The specifications of the filter offer will prevail and are guaranteed.

### 3. General

#### 3.1 Description of the drum filter

The Bio-drum and/or the drum filter consists of a drum sieve that is driven by an electro-motor. Additionally, control electronics and a rinse pump are included. The drum filter serves to filter and discharge floating particles, dirt particles and algal remains. Regarding the Bio-drum there is an additional space, fitted with an air stone or air disc, in which the organic filter material Helix can be placed.

This drum filter is a product that may be applied only in fresh water. The filter was designed for use in ponds.

The water to be filtered flows (due to gravity or pumping) into the inlet openings of the drum. On the inside of the drum, dirt will remain behind as a result of the mesh that was fitted across the drum. As the cloth gets more polluted, less water will flow through the drum. The water level behind the drum will fall (in case of a gravity installation) and a sensor present there, measuring the water level, will subsequently activate the electronics. The electronics will send a signal to the motor of the drum and to the rinse pump. The drum will rotate, while the rinse pump will, under high pressure, control the nozzles that spray the mesh in the rotating drum clean. The waste water is collected by a duct in the drum and will flow outside, via the duct, for instance into the sewer. After the set rinsing time has elapsed (14 seconds as standard), the electronics will be deactivated again. The drum will stop rotating and the pump will stop spraying water towards the nozzles.

#### 3.2 Warnings

Only staff with sufficient knowledge about drum filters is permitted to perform maintenance/activities on this equipment. This staff must be familiar with the international regulations for accident prevention. Connection and settings must be in conformity with the applicable electrical regulations.

#### 3.3 Used symbols and warnings

##### **WARNING – ELECTRICAL DANGER! LIFE-THREATENING!**



Electric shocks may lead to death or serious physical injury for staff, or damage to the equipment. Ensure that unauthorised people are not able to get access or may come in contact with the device. Disconnect the device from the power supply before you start working on it. Do not put the filter in use if the power supply has not been correctly connected to the (protective)earth.



### **PLEASE NOTE! ROTATING PARTS! AUTOMATIC RESTART!**

Take adequate measures to ensure that all rotating parts are secured against physical contact when the filter is in operation. Rotating parts may make the operation of the machine a source of danger for the service staff.



### **CAUTION!**

Before connecting the filter, make sure it is not damaged. Carefully check the power cables and plugs before connecting them.



### **Please note:**

In case of installation works, disconnect all plugs of the device from the power supply. Plugs of other equipment that are in contact with water, must also be removed.

### **Please note:**

Never put your hands in the water before the plug has been removed from the socket. This applies to all electric equipment that is immersed or in contact with water.

### **Please note:**

Keep out of reach of children before and during assembly. Only suitable for people who are aware of the possible dangers of this device.

### **Please note:**

Never try to stop the drum with your hands when it is rotating.

### **Please note:**

Ensure that the rinse pump always has sufficient water during operation. It should not run dry.

### **Please note:**

The drive motor and all electrical connections may not come in contact with water. If this happens, you must ensure that everything is thoroughly dry before taking the filter back into use.

### **Please note:**

The control and rinse pump of this drum filter may only be connected to an earthed socket. This socket must be equipped with a 30mA residual current device.

## 4. Usage of the filter

Only use the filter when no body parts are in contact with the water! Before touching the water you must always disconnect the filter from the socket.

Compare the electrical specifications on the type plate of the device with the specification of the connection on the power supply. Ensure that the device is connected to a socket with earth and a ground leak switch with a maximum residual current of 30 mA (DIN VDE 0100T739). Use the device only when connected to a correctly installed socket.

Keep the plug and the wiring dry! Ensure that the cables are protected to prevent damage and consequential short-circuit.

**THE ELECTRICAL WIRING AND/OR PLUGS MAY NOT BE CUT (THROUGH). DOING THIS WILL CAUSE THE MANUFACTURER'S WARRANTY AND LIABILITY TO EXPIRE IMMEDIATELY.**

Only use cables, installations, adapters, extension cables and connection cables with earthed plugs, that were approved for outdoor use (DIN VDE 0620) with sufficient cable diameter. If the wiring is damaged or broken, it must be replaced. Ensure that the plug will not fall into the water or get wet. A wet plug must be cleaned by use of demineralised water and dried. Protect the plug and cables against heat, oil, UV-light and sharp corners. The manufacturer is not responsible in any way for any damage, caused by incorrect installation or as a result of carelessness of the user or installer.

The cable may not be altered or replaced. Electrical installations must always comply with the national and international requirements/guidelines. Never open the casing of the control electronics. Never make technical modifications. Use only original parts and accessories, as set out in this manual. Only authorised dealers are empowered to perform repairs.

Never use the filter with other liquids than water.

## 5. Application fields

The Bio-drums or drum filters are suitable for the filtration of fresh or slightly brackish water.

Temperature water: 4-40 °C.

Ambient temperature: 2 °C to +50 °C

Protection class Electronics: IP54

## 6. Installation/Connection

Carefully read the manual before installing the filter. Damage as a result of failing to properly observe the manual, will not be covered by the warranty.

When unpacking the filter, check whether all parts are complete and undamaged. Any identified damage must be reported to your supplier within 24 hours. Check the filter for damage before you put it into service. Do not use the filter if it is damaged. If the filter has been used and is damaged, the warranty and liability will expire.



The filter must not be connected to the power supply during installation. Remove the plug from the socket and make sure that the filter cannot be activated. In order to prevent injury, you must ensure that you are absolutely unable to

reach the rotating parts of the filter with your hands and fingers once it has been connected to the power supply.

## 7. Commissioning of the filter

### **NEVER USE THE DEVICE WITHOUT WATER FLOW.**

#### **7.1 Positioning of the filter**

- You must strictly follow regulations that are mentioned below to work safely and prevent damage to the device.  
Make sure that the substrate is levelled and sufficiently solid; a concrete slab is preferred.
- When checking whether the rinse pump or motor of the drum still works, the lid must always be closed. Never put your hands in the filter, or try to stop the drum.
- The rinse pump must always be below the water level before it is activated. Otherwise it will be damaged irreparably due to running dry or overheating. Damage to the rinse pump as a result of running dry will not be covered by the warranty.
- The electronics must hang in a dry and well ventilated space. The temperature of the space with the electronics must be between 2 and 30 °C. In case of higher temperatures, the electronics cannot get rid of its heat as a result of which it may get damaged.
- The electronics contains switching components and must be placed in an interference-free room.
- Certain pumps or UV-units may negatively affect the functioning of the electronics.
- In case of frost, the filter must be protected against freezing. If the filter is taken out of operation, all pipes must be empty. If the filter remains operative, the pipes for the rinse water must be protected against freezing. Damage as a result of freezing of water is not covered by the warranty.



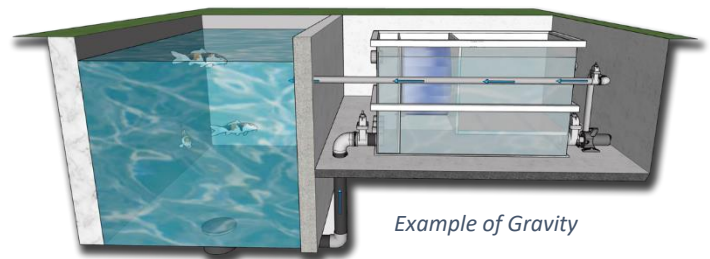
#### **7.2 Connecting Gravity**

If the water flows into the drum with gravity flow, the maximum water level must be properly aligned with the drum. The maximum and minimum water levels are indicated on the inside of the filter and it should be between them, preferably as close to the maximum level as possible (see image). The filter has 110 mm entries and 110 mm exits. In addition, there is a connection for the rinse pump for the Biodrum 30.

#### **Please note:**

For installation on gravity-basis, sufficient water feed is very important for proper functioning of the filter!

There is a risk of the rinse pump running dry and a very frequent activation of the rinse cycle if there is insufficient water supply, due to an incorrectly installed system.



A rule of thumb is that per 110 mm of pipe, approximately 10 m<sup>3</sup>/hour can be moved in a gravity-setup. However, this quantity largely depends on the length of the pipe and the maximum height difference between the pond water and the filter. In some cases only 3 m<sup>3</sup>/hour can be moved.

#### **So pay attention to the following, with regard to a maximum flow per pipe:**

The pond water level should not sink too much. If the pond water level sinks by 1 cm, the flow per tube may fall by as much as 1 to 2 m<sup>3</sup>/hour. In case of large fluctuations of the pond water level (due to evaporation, replenishing or if you rinse the filter) there is a risk of insufficient water being supplied to the filter. If your pump pumps more water than arrives into the filter, the drum will be pumped empty and the sensor will appear above the water level, which will cause the filter to go in rinse cycle.

If the supply pipes are of significant length, with many curves, there will be lots of friction loss and a lot less than 10 m<sup>3</sup>/hour may be supplied per pipe.

Entries that are not used should be sealed.

drainage of dirt:

The dirt will be sprayed through the nozzles of the mesh, into the flushing channel. The flushing channel can be connected directly to the sewer or to a drainage point.

Return to pond:

The pump is connected to the 110 mm drain. If necessary, make use of a flexible coupling, for a good transit to your pump. A flexible connection will also reduce vibrations.

Make sure that you never apply a pump larger than recommended for the filter. As you go towards the maximum of the filter in terms of the selected pump, you should ensure that sufficient water is supplied and that the dry running function of the electronics is engaged. This is indicated on the display in the Electronics box.

### 7.2.1 Setting for sensor/float

Upon delivery, the sensor has already been installed for use as gravity and in such a way that it will function properly in most situations. Still you will need to check on proper functioning after installation and adjust the float in the best way possible.



1: Normal position (recommended)



2: Lowest position

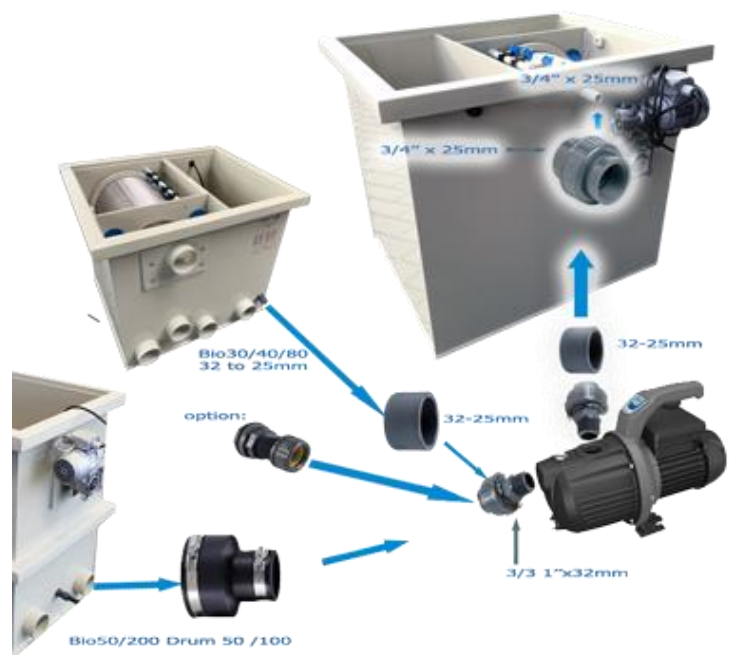


3: Highest position

If the float is in lowest position (4), the filter will postpone the rinsing function, creating more pressure in the drum (not recommended). Although, in case of a calamity or too little water supply from the soil drains, this could be a temporary solution, so the filter can keep running. If the float is in highest position (image 3) the filter will rinse more quickly and more often. Image 1 represent the 'normal' position, recommended for most ponds.

The cables of the float must be connected to numbers 1 and 2 in the electronics box. The wires of the magnet contact must be connected to numbers 3 and 4.

### 7.2.3. Connecting the rinse pump



The external Rinse pump is included with the drum filters and Bio-drums, as standard. In case of the Bio-drum S, a connection has already been installed for the suction side of the rinse pump. For the other types, you can use one of the 110 mm exits, by applying an adapter (ring) towards 32 or 25 mm for the rinse pump.

Or create a transit yourself at the location of your choice, using a 25 or 32 mm tank transit. Make sure that you assemble this transit into the 'clean' side of the filter and not into the first chamber where the dirt enters. This is to prevent clogging of the spray nozzles.

You connect the exit of the Rinse pump with a hose (or even better, PVC) to the 3/4\"

Ensure proper adhesion bonding! The pipe is under pressure during rinsing! Use high pressure PVC. The plug of the rinse pump must be connected to the electronics in the FLUSHING PUMP plug.

#### 7.2.4. Connecting motor drum filter

The plug of the motor of the drum filter must be connected with the control electronics. Use the plug connection 'MOTOR DRUM FILTER'.



Float is in 'rinse' position, pond pump is on. Drum is rotating and rinse pump rinses the cloth. If the float remains in this position for 30 seconds, the electronics will switch to DRY-RUNNING MODE.



#### 7.2.5 Flushing frequency

Make sure that the flushing frequency is not too high. If the drum is installed in an existing system, the coil frequency will be high over the first days/weeks, because the pond is being 'cleaned'. In case of warm weather, the flushing frequency will be higher (more food and more algae growth) than in case of colder weather.

Other causes of a (too) high flushing frequency are:

- A pond pump that is too large
- Too little water is supplied, due to a low pond water level or incorrect supply system from the pond, e.g. too long pipes, too few pipes or pipes with an insufficient diameter
- Float is set too high
- Clogged mesh, due to e.g. bacteria
- Too little pressure in rinse pump
- Too little flow from rinse pump



Enable Drum pond filtration controller:

Connecting the float switch

1 Open the box. First turn the red button to o.

2 connect the float:

Feed the wire from the float into the top lead-through. Now connect the wires to the green plug:



Float is in 'normal' position, pond pump is on.





If the system is filled with water and the float switch is connected:

Press on the 2 AUT buttons to start the system.



The green lights above AUT illuminate. The system is activated. These lights must always be on! You can also turn it off by pressing the red button (s). This is for installers only. Make sure the green lights are always on by pressing the AUT buttons.



Pay attention! Do not perform maintenance with the lid off the drum. Remove the plug from the socket and make sure that the filter cannot be switched on. To avoid injury, make sure that your hands or fingers cannot reach the rotating parts of the filter when it is connected to the mains.



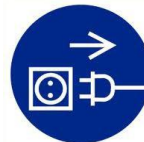
The system is on stand-by if the float is floating. If the float is in the lowest position, the process will commence (drum starts rotating and the rinse pump will rinse the cloth). This will last for 14 seconds with the Makoi Drum Control and about 20 second with the Drum Pond filtration Controller.

If the float remains in the lowest position (and the pond pump is on) there will be too little water supply from the pond. The drum will rinse for 30 seconds (standard value) and then switch to dry-running mode.

This is to protect your pond pump. Once the float goes back to normal position (it will float again because sufficient water flow into the filter) the pump will activate after 5 minutes (standard value).

### 7.2.6 Control electronics

The control electronics has protection class IP54.



Electrical installations must always comply with the national and international requirements/guidelines.

Only open the casing of the electronics to connect the float and magnet contact or to set the parameters.

When connecting the float, disconnect the device from the power supply before connecting it! Changing the parameters is done at own risk in case the power supply is connected. Be aware of electrical hazard when opening.



The control cabinet must be connected to an approved, earthed socket. The electronics must be installed vertically. The electronics may not be assembled unprotected during rain. A maximum of 1500W of auxiliary equipment may be connected per connected side.

**Manual flushing Drum Controller**



If you keep the manual button pressed, the pond pump will stop and the motor and rinse pump will be activated. When you release it, the system will turn off. Then press the AUT buttons again (green light will turn on again) to reactivate the system (pond pump will turn on again).

If you press the red button on the right, the pond pump will be switched off



AUT light turns off.

Then press the AUT button again to turn the pond pump back on. AUT light turns on again.

Pressing the Left Red button will turn off the pond pump, motor and rinse pump. Always press the AUT buttons to turn everything back on to avoid problems.



**THE GREEN LIGHTS MUST BE ON AT ALL TIMES! OTHERWISE, THE SYSTEM IS OFF OR WILL NOT BE RINSED! MAKE SURE YOU CHECK THIS.**



The float switch must be in the top position with gravity systems (with pump fed in the bottom position) otherwise the system will not switch on to prevent the pond pump from running dry.



Gravity

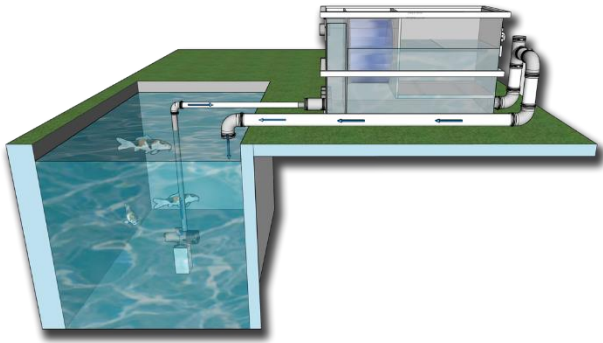


Pump fed



Connect the Float to the black side connector

## 7.3 Connecting the pump-fed system



The drum filters and Bio-drums can also be connected as a pump-fed system. The water will be pumped into the filter by the pump. Exits that are not used must be sealed.

### 7.3.1 Assembly of float

In this case, you will need to assemble the float upside down for the drum section (at the inlet) 1<sup>st</sup> chamber:



Float is in 'normal' position, pond pump is on

#### **Please note:**

The float must be installed in reverse, because the circuit here is to work reversely. The upper blue caps must be removed. If the water rises in front of the drum filter, it becomes polluted and the rinse cycle must be activated. If, in the reversed situation, the float goes up and stays up, the system should deactivate after 30 seconds (standard value - this can be adjusted manually in the electronics), otherwise the water will flow straight to the sewer, via the flushing channel, and your pond will run empty. Therefore, the float must be assembled at the right height, so the system will be deactivated before the water flows into the flushing channel.

As an additional safety precaution, the 2 caps of the upper sealed holes must be removed so, in case of a calamity, the water will continue flowing unfiltered, eliminating the risk that water is pumped directly into the flushing channel.

If the float is in the lowest position, the system is in stand-by. If the float is in highest position (float is floating) then the process will commence (drum will start rotating and the rinse pump will spray-clean the cloth). This will last for 14 seconds (standard value).

If the float remains in the highest position (if the water pump is on), too little water will flow away from the filter. The drum will rinse for 30 seconds (standard value) and the electronics will switch to dry-running protection.

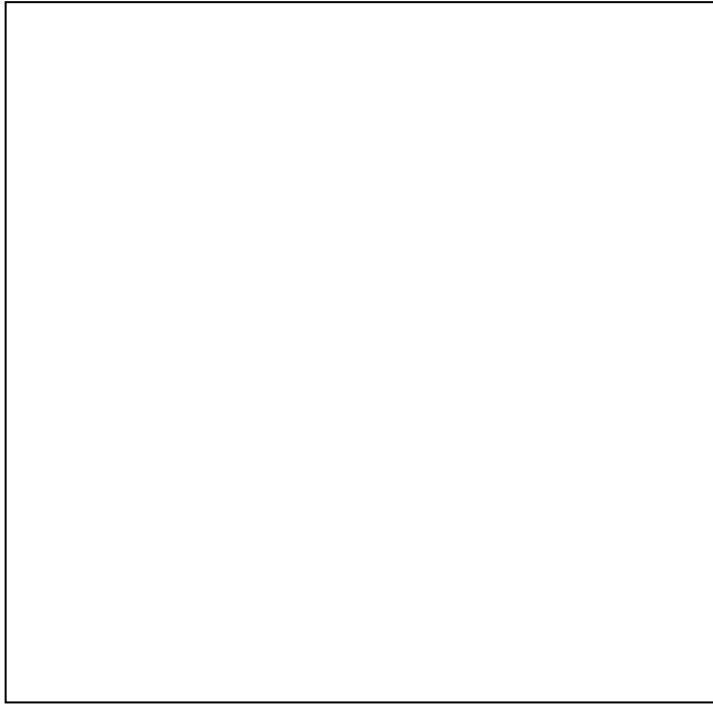
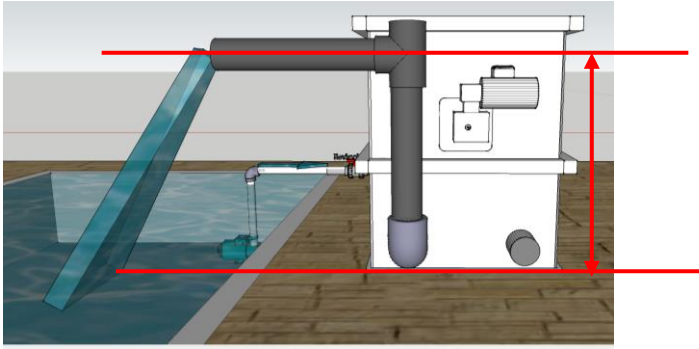
### 7.3.2 Connection of return to pond

The return after the filter should first go up to determine the desired height inside the filter. It should not be too low, in connection with the bio-filter material present. Neither should it be too high, because this will lead to a high coil frequency of the filter. Also here it applies that the drum should be adjusted during operation. A rinse cycle must be started when the water level difference before and after the drum is approx. 10-15 cm. Make sure that the vertical section remains open to prevent tilting action, causing the drum filter to be pumped dry.



Float is in "rinse" position, pond pump is on. Drum turns and rinsing pump rinses the cloth. If the float stays in this position for 30 seconds, the electronics will go into DRY RUN MODE.

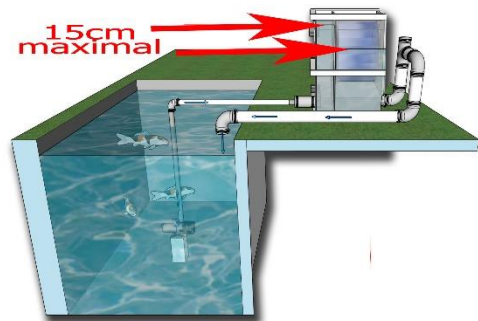
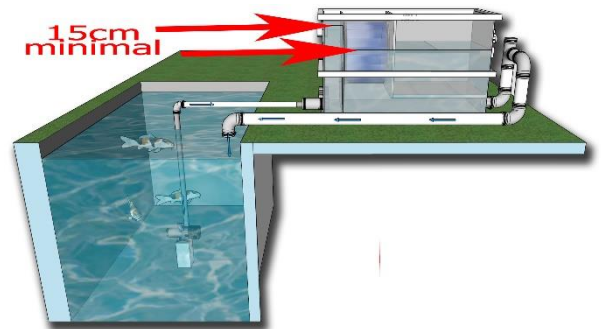
If you wish to pump more water than 1x 110 mm pipe can handle concerning the gravity, you must create additional transits. You can also connect the return to the pond by use of a wider diameter pipe.



## 8. Maintenance and cleaning

The filters are low maintenance. However, maintenance- and inspection tasks below are required for proper functioning:

- Check the correct functioning of the float every month.
- Perform a manual rinse every month and check whether the nozzles perform good spraying. A nozzle may get clogged or calcified. The rinse pump may also perform less pressure. Clean the nozzles if necessary.
- Clean the sieve element with a strong acid (hydrochloric acid 30-35%). After a while, biofilm and calcium deposits may arise, as a result of which the rinse frequency will strongly increase. Observe the safety regulations during cleaning with acids. Wear protective clothing and safety goggles.



### Please note:

That in terms of Bio-drums, the water in the last chamber (biological chamber) is at least 15 cm lower than in image 2. So this is just before your drum filter will rinse.

With Drum filters 100 and 50, the incoming water column may not be more than 15 cm higher than the outgoing water column at the time of rinsing. If this is the case, too much water will remain in the Drum and the drum may deform.

## 9. Technical specifications

Rinse pump external: Oase ProMax Garden Classic 3000

Pressure: 4.1 bar.

P: 600W

Qmax: 3000 l/h

U: 220-230V

Rinse pump internal:

druk: 6 bar.

P: 1000W

Qmax: 3500 l/u

U: 220-230V

Electronica:    Controller  
                  IP55  
                  Max. capacity : 3100W  
                  Pressure: 220V/50-60Hz

## 10. Declaration of distributor

In addition to what is set out in this manual, the general terms of Supplier apply for any claims against Supplier with regard to the products in this manual.

Specifications may vary as a consequence of technical improvements.

Should this filter in any way not meet the requirements you would expect, then contact the dealer where you purchased the filter.