



**INSTALLATION AND USER MANUAL FOR
ILEX BIODRUM 20**



Ilex Filtration Biodrum 20 +31384447366

Subject to typesetting and printing errors

Table of Contents

1. Preface	3
2. Defects and claims for compensation, disclaimer	3
2.1 Defects and claims for compensation	3
2.8 Spare parts	4
2.9 Subject to alterations	4
3. General	4
3.1 Description of the drum filter	4
3.2 Warning Notes	4
3.3 Used symbols and warnings	5
4. Use of the drum filter	6
5. Fields of application	6
6. Installation/Fitting	6
7. Operating the filter	6
7.1 Siting the filter	6
7.2 Gravity connection	7
7.2.1 Sensor setting for the rinse cycle	7
7.2.2 Safety float	8
7.2.3. Waste pump connection	8
7.2.4. Connecting the drum filter motor	9
7.2.5 Rinse frequency	9
7.2.6 Control electronics	9
7.3 Connecting a pump-fed system	9
7.3.1 Float installation	9
7.3.2 Connecting the pond return	10
8. Maintenance and cleaning	10
9. Technical Information	11
10. Distributor's declaration	11
10.1 Distributor	11

**NEVER USE THE DEVICE
! WITHOUT WATER THROUGHPUT !**

1. Preface

Thank you for purchasing a Ilex Drum filter. This filter is a high quality product with the highest manufacturing demands.

This manual is intended to help you set up the filter for use and provide advice on the required maintenance procedures. This guide aims to provide you with correct and complete information.

To ensure long-lasting satisfaction with this product, please read this manual carefully and follow our guidelines.

**PLEASE KEEP THIS MANUAL IN A SAFE PLACE!
IF THIS PRODUCT CHANGES OWNERS, PLEASE
PROVIDE THE COMPLETE MANUAL!**

If you are uncertain about the contents of this guide or do not fully understand the assembly instructions and/or anything regarding this product, please contact the shop where the product was purchased.

This manual is intended to inform you correctly and comprehensively, i.e. also over potential risks caused by the filter. The user, installer and maintenance technician is responsible for checking compliance with the procedures and advice in this manual. This filter is built using state-of-the art technology and to ensure compliance with existing safety regulations.

Nevertheless this device may cause risks for individuals and for property if it is used incorrectly or not according to its designated use or if safety advice is ignored.

The manufacturer does not accept any liability if the filter is not used properly. For safety reasons, children and juveniles under the age of 16 and people who do not recognize the possible risks or who are not familiar with this manual may not use the device.

The combination of water and electricity can be a serious threat to life and limb if the filter is not installed according to the instructions or if the filter is used incorrectly.

The General Terms and Conditions of Ma-koi apply to all products.

2. Defects and claims for compensation, disclaimer

2.1 Defects and claims for compensation

Except in the case of a further claim, Ma-koi is only liable for defects to the delivered goods until the

risk has been transferred to the purchaser. Minor variations of the model / appearance that have no or a marginal influence on the intended use of the product are excluded.

Warranty regarding use and suitability for an application is only accepted if it falls within the written specifications of Ma-koi as stated in this manual. Any other verbal agreements, for example in preliminary discussions, advertising, etc. in relation to the product are only valid if the promised is an integral part of a written agreement.

Only conditions and specifications stated by Ma-koi are valid. Ma-koi does not accept conditions and / or specifications from third parties. The specifications as stated in this manual are leading. If the customer wishes to use the product for a purpose other than the intended purpose, he or she is obliged to thoroughly explore the suitability of the product for this other purpose. In any case, the customer bears full responsibility and any liability lapses if the product fails. We give no warranty and accept no liability for any use other than that explicitly approved by us in writing.

Any changes made to the product will result in the loss of warranty and all claims and rights will lapse.

Each user is responsible for the correct use of the filter. The manual does not release the user from liability for safe application, correct installation, operation and maintenance. By using this manual, you agree that under no circumstances will the manufacturer be held liable for personal injury or property damage that may occur as a result of the use of the filter. This applies in particular to damage resulting from inadequate piping or connections.

Damage caused by insufficient cleaning or maintenance intervals is not covered by the warranty.

2.2

The warranty for defects is strictly limited to additional services to remedy the defects. This is at Ma-koi's own choice to rectify the defects or replace the parts that do not comply. In the event of failure to remedy the defects or not being able to deliver replacement parts, the customer has the right to withdraw from the purchase agreement. It is explicitly stated that the warranty is limited to the filter itself.

Ma-koi accepts no liability for consequential damage (water flow, loss of animals, etc.) due to the failure of the filter in any form, even if caused by a defect or failure of the filter.

2.3

The customer must immediately and thoroughly inspect the goods upon delivery. (Apparent / possible) damage must be reported immediately in writing. Hidden defects must be reported immediately upon discovery. The customer is responsible to report transport damage to the carrier and / or to Ma-koi within 24 hours. Failure to timely check and report transport damage can lead to loss of warranty.

2.4

Ma-koi is not liable for the consequences of incorrect application, use, maintenance and / or operation of the product by the customer, nor for normal wear and tear. This applies in particular to the consequences of thermal, chemical, electrochemical or electrical influences and also for not following our user guide. The same applies to damage resulting from changes or modifications to the product that have not been approved by Ma-koi in advance.

2.5

In principle, the customer is responsible for damage directly attributed to the incorrect use of the product. If the customer returns the product, break-proof packaging should be used. The customer is liable for any damage that can be attributed to inappropriate packaging.

2.6

Claims against Ma-koi expire within a year after the initial delivery of the goods to the customer. The same applies to damage claims, regardless of their legal cause. The limitation period does not apply to claims based on the malicious concealment of damage, injury to life, body or health or any other damage resulting from intent or wanton negligence.

2.7

If it becomes apparent during our examination of damage reported by the customer or in the course of repairing defects that the reported damage or claims were made wantonly or were unwarranted, Ma-koi may charge for inspecting and repairing defects. The customer has the right to reject a necessary repair and to demand the return of the filter. In general, every inspection of damage is bound to lump sum compensation if it appears that the customer is responsible for the damage.

2.8 Replacement parts

Our liability to deliver and stock spare parts is limited to the period of 5 years after initial shipment of the product. For spare parts the prices apply as stated on the website www.Ma-koi.com.

2.9 Subject to alterations

The manufacturer is entitled to change the product at any time without prior notice being required, as long as these changes improve the reliability or quality of the product. No claims can be made if, for example, the design, functionality or performance of the filter fundamentally changes. The confirmed filter specifications are always guaranteed.

3. General

3.1 Description of the drum filter

The Drumfilter consists of a drum sieve that is driven by an electric motor. Control electronics and a waste pump are also supplied. The drum filter has the job of filtering and discharging suspended substances, dirt particles and algae residue

This drum filter is a product that can only be used in fresh water. The filter has been designed for use with ponds.

The water to be filtered flows (by gravity or through a pump) into the inlets in the drum. On the inside of the drum, the dirt remains behind because of the mesh that is stretched over the drum. As the mesh becomes dirtier, less water flows through the drum. The water level after the drum drops (with regard to a gravity system) and a sensor that is present there that measures the water level, subsequently, switches the electronics. The electronics sends a signal to the drum motor and waste pump. The drum rotates and the rinsing pump operates the nozzles with high pressure that clean the mesh of the rotating drum. This wastewater is collected by a duct in the drum and flows outside through the duct to, for example, the sewer. After the sensor detects that the water level is sufficient again, it switches the electronics off again. The drum will stop turning and the pump will stop spraying water to the nozzles.

3.2 Warning Notes

Only appropriately trained personnel may commission and maintain this drum filter. These personnel must be familiar with international accident prevention regulations. Connection and adjustment must be in accordance with current electrical regulations.

3.3 Symbols used



WARNING – ELECTRICAL HAZARD! DANGER OF DEATH!

Electrical shocks can cause death or serious physical injury to personnel as well as pose a risk to equipment. Ensure that no unauthorised persons are able to gain access to or come into contact with the filter. Disconnect the filter from the power supply before working/installing the filter. Never operate the device when the mains is not properly connected to earth.



CAUTION! ROTATING PARTS! AUTOMATIC RESTART!

Please take adequate measures to ensure that all rotating parts are safe from physical contact when the filter is in operation. Because of the rotating parts, operating the device with open lid can be a source of danger to operating personnel.



CAUTION!

Before connecting the device, make sure there is no damage to the filter. Check the power cords and plugs carefully before connecting them.



Pay attention:

Remove all plugs from the mains during installation work. Also remove plugs from other appliances that come into contact with water.

Pay attention:

Never put your hands in the water before unplugging it. This applies to all electrical appliances that are submerged or in contact with water.

Pay attention:

Keep and assemble out of the reach of children. Only suitable for people who are aware of the potential dangers of this device.

Pay attention:

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

Pay attention:

Make sure the flushing pump always has enough water during operation. It must not run dry.

Pay attention:

The drive motor and all electrical connections must not come into contact with water. If this happens, make sure everything is completely dry before using the filter again.

Pay attention:

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

4. Use of the drum filter

Only use the filter when no body parts are in contact with the water! Before you reach into the water, always disconnect the filter from the power supply. Compare the electrical specification on the type label of the device with the specification of the power supply. Make sure that the device is connected to an ELCB (earth leakage circuit breaker) with an assigned leakage rating of max. 30 mA (DIN VDE 0100T739). Only operate the device on a correctly installed power plug.

Keep the power plug and the wiring dry! Make sure that the cables are protected to prevent damage and consequent short circuits.

THE WIRING OR THE POWER PLUGS MUST NOT BE CUT. DOING SO WILL IMMEDIATELY INVALIDATE ALL WARRANTY AND LIABILITY OF THE MANUFACTURER.

Only use wiring, installations, adapters, extension cables and connection cables with grounding-type plugs, which are approved for outdoor usage (DIN VDE 0620) with sufficient cable diameter. Do not pull on the wiring of the devices or use the wiring to carry the devices! If a wiring is damaged or broken, the device may no longer be used! Take care that power plugs never falls into water or gets wet. If a plug gets wet, it must be opened by a professional and cleaned by purging with demineralised water. Protect plugs and the wiring from heat, oil, UV light and sharp corners. The manufacturer is not liable in any way for any damage caused by improper installation or by the carelessness of the user or installer.

The wiring may not be modified or replaced. Electrical installations on garden ponds must always comply with national and international directives and requirements. Never open the case of the device(s) or of the appending parts if this is not explicitly suggested in the user manual. Never apply technical modifications of the device(s). Only use original spare parts and accessories. Only allow authorised customer service facilities to conduct repairs. Never use the filter with any other liquids than water.

5. Fields of application

The Drum filter is suitable for freshwater and brackish water.

Temperature of the water: +4 to +40 °C.

Environment temperature: +2 to +50 °C

Protection class control box: IP54.

6. Installation/Fitting

CAUTION:

Before you install the filter, read the manual carefully. Damage caused because the manual was not read thoroughly does not fall under warranty.

When unpacking the filter, check if all parts have been delivered completely and undamaged. Any damage detected must be reported to your retailer within 24 hours of purchasing the filter. Please check the device for damage before you operate it. Do not use the device if it is damaged. Please inform your retailer immediately. If the device is used despite being damaged, any warranty and liability will then be invalid.

During the course of the installation, the device may not be connected to the power supply. Remove all plugs from the electric sockets 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 power supply.



7. Operating the filter

NEVER USE THE DEVICE WITHOUT WATER THROUGHPUT.

7.1 Placing the filter

You must carefully follow the instructions below to work safely and prevent damage to the equipment.

- Ensure that the substrate is levelled and sufficiently robust; the filter weighs more than 400 kg when operational. A concrete slab is the preferred option.
- When checking if the waste pump or drum motor is still working, the lid must always be closed. Never put your hands in the filter or try to stop the drum with your hands.
- The waste pump must always be below the water level before it is switched on. If not, it will be irreparably damaged because of running dry or overheating. The warranty will not cover damage to the waste pump because the pump has run dry.
- The electronics must be suspended in a dry and appropriately ventilated room. The temperature of the room where the electronics is suspended must be between 2 and 30 °C. If the temperatures are higher, the electronics cannot handle its own heat properly and this may lead to damage.

- The electronics contain components that switch and must be suspended in a failure free room. Specific pumps or UV units may have a negative impact on the operation of the electronics.
- The filter must be protected against freezing when there is frost. If the filter is put out of service, all pipes must be emptied. If the filter stays in service, the pipes for the rinse water must be protected against freezing. Damage caused by water freezing is not covered by the warranty.

7.2 Gravity connection

If water flows into the drum due to gravity, the maximum water level must be correctly aligned with the drum. The maximum and minimum water levels are indicated on the inside of the filter and must be between these values and, by preference, as close as possible to the maximum level (see the figure). The filter has 3 x 110 mm inlets and 1 x 110 mm outlet. In addition, there is a connection for the flushing pump.

Attention:

It is essential that sufficient water arrives in the filter when installing on a gravity basis to ensure its correct operation! If insufficient water arrives because the system has been installed incorrectly, you run the risk of the waste pump running dry and that the rinse cycle is switched on very frequently.

It applies as a general rule that approximately 10 m³/hour can flow per 110mm of pipe in a gravity set-up. This quantity, however, will depend on the length of the pipe and the maximum height difference between the pond water and filter. In some cases, for example, only 3m³/hour can flow per pipe.

Therefore, pay attention to the following issues for a maximum flow per pipe:

The pond water level may not drop too much. If the pond water level drops 1cm, the flow rate can already drop by 1 or 2m³/hour per pipe. There is a risk that insufficient water arrives in the filter when there are considerable fluctuations in the pond water level (due to evaporation, water change or when you rinse the filter). If your pump pumps away more water than arrives in the filter, the drum filter will be emptied, the sensor will run dry and the filter will start the rinse cycle.

If the supply pipes are long and with many bends, there are many friction losses and much less can arrive instead of 10 m³/hour per pipe system. Inlets that are not used must be plugged.

Discharge of dirt:

The dirt is sprayed off by the mesh nozzles into the rinse duct. The rinse duct can be connected to the sewer system or discharge drain directly.



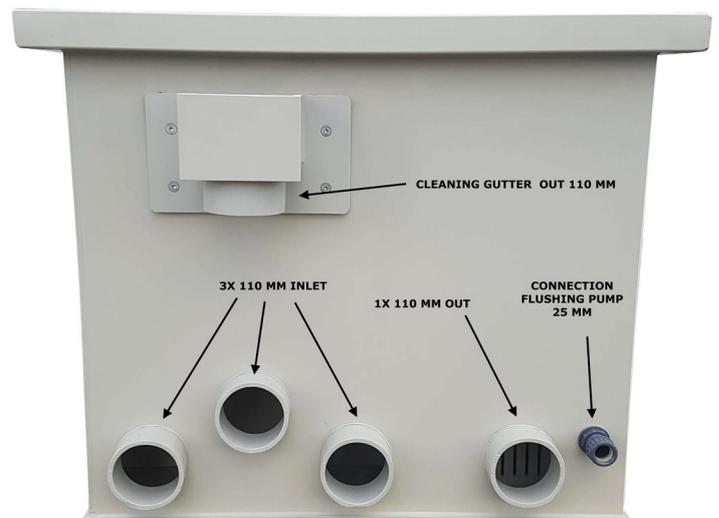
Pond return:

The pump must be connected to a 110mm discharge. If required, use a flexible connection for a good transition to your pump. A flexible connection will reduce vibrations.

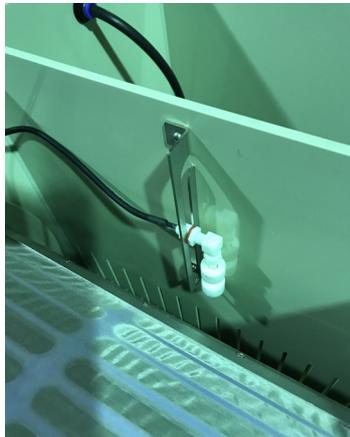
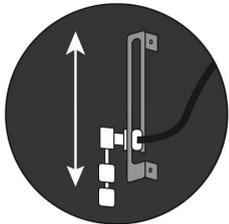
Make sure that you never install a larger pump than recommended for the filter. If the pump you have selected is close to the maximum of the filter, you must ensure that sufficient water arrives and that the filter is not suctioned dry.

7.2.1 Sensor setting for the rinse cycle

The sensor will already have been installed for use as a gravity sensor and in such a way that it will operate correctly in most situations. You must, however, check its correct operation after installation and adjust the float as correctly as possible.



The floats act as a break contact. If the top float is 'dry', the water level behind the drum is too low because the mesh is clogged: the pump pumps away more water than is being supplied through the bottom drains/skimmer. The electronics will switch and the filter will rinse.



The top sensor can only be adjusted correctly when the system is commissioned. The water level for the drum will then drop. Now, the top float must not be set lower than 10 cm below the water level inside the drum. By preference, this difference level between the inside and outside of the drum should not be more than 8 cm **during** operation. If the difference in level is too great, the drum will turn heavily and the load exerted on the drum filter motor will be high. If the difference in level is too little, the rinse frequency will be too high.

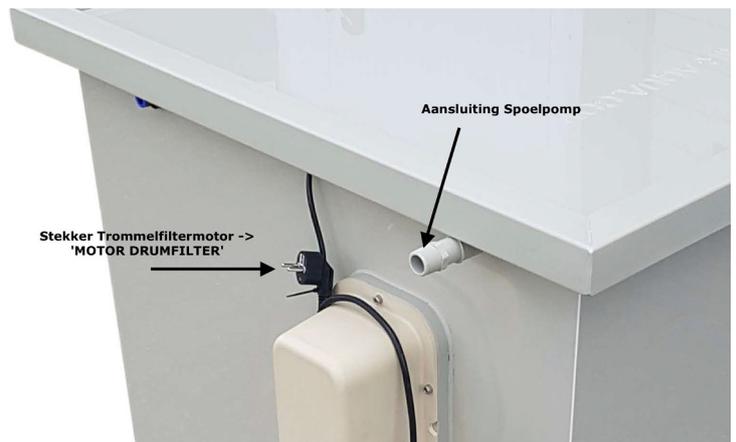
7.2.2 Safety float

The bottom float is for protection. If the water level continues to drop, the system will be switched off by the electronics. If the system pump and UV unit are also connected on the plug connections for this purpose of the electronics ('PUMP' and 'UV-C'), they will also be switched off. This will ensure that neither the pump nor the UV will be without water. Waste pump connection

7.2.3. Connecting flushing pump

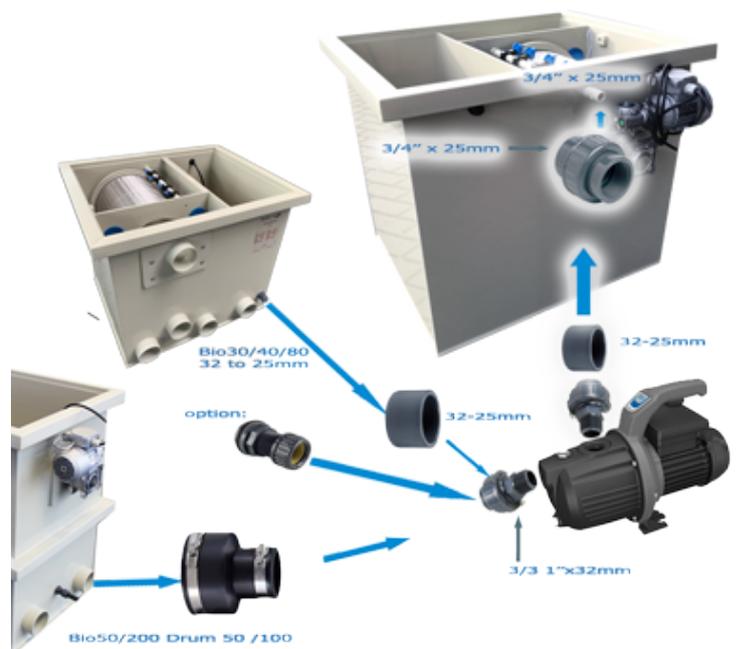
The waste pump is already included with the Drum and it is positioned outside the filter. There is not already a connection for the suction side of the, but you can create a connection at a different place as long as the supply of the rinse water is installed after the drum filter so that the waste pump has clean water and the nozzles cannot be obstructed.

When the water level is again OK, everything will again be switched on with a small time delay. You can connect the float plug to the female plug of the control electronics. Pay attention to the recess of the plug connection.



The pressure side of the pump must be connected to the pipe to which the nozzles have been connected. Ensure that the connection on the pressure side is good and properly sealed because the pressure of the pump is high (up to 5 bar). Do not therefore use sewer PVC but high-pressure PVC that can withstand at least 10 bar.

The waste pump plug must be connected to the control electronics in the 'RINSE PUMP' plug connection.



7.2.4 Connecting the motor drum filter

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

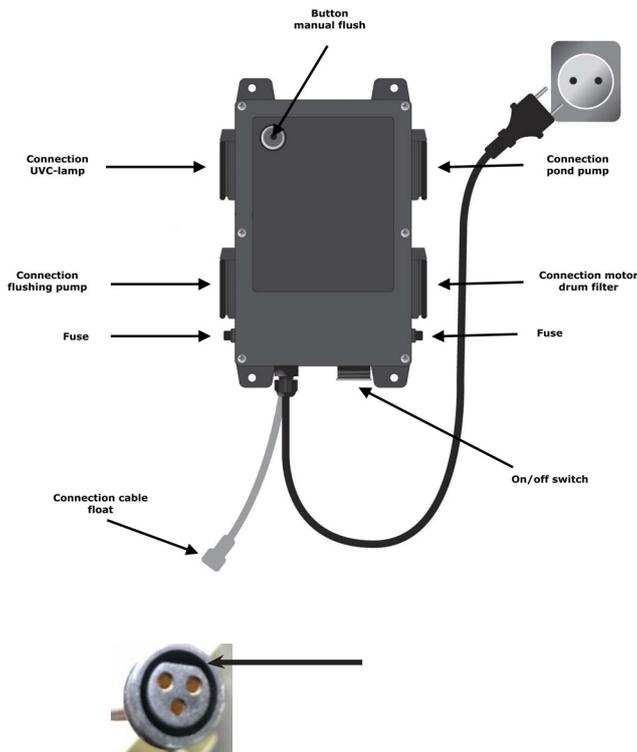
7.2.5 Rinse frequency

Ensure that the rinse frequency is not too high. If the drum is being installed in an existing system, the rinse frequency will be high during the first days/weeks because the pond will be 'cleaned'. The rinse frequency will also be considerably higher when the weather is hot (more food and more algae growth) than during colder weather.

Other reasons why the rinse frequency is (too) high include:

- The pond pump is too large.
- Too little water arrives because the pond water level is too low or the supply system is incorrect from the pond such as pipes that are too long, too few pipes or the pipe diameter is too small.
- The top sensor is set too high.
- The mesh has become completely clogged because of, for example, bacteria.
- The pressure of the waste pump is too low.
- The waste pump flow rate is too low.

A rinse frequency that is too high will lead to a high rinse water consumption.



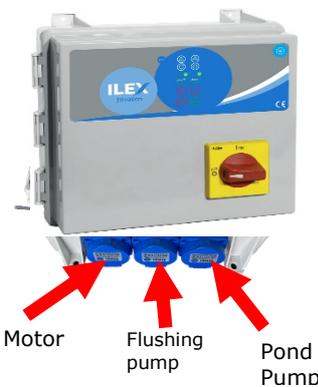
7.2.6 Control electronics

The control electronics has a protection class of IP54. Electrical systems must always meet national and international requirements/directives. Never open the housing of the electronics. The electronics are sealed and the guarantee will be null and void if the seal is broken. Never make technical changes. Only authorised dealers may perform repairs.

The control cabinet must be connected to an approved earthed power socket. The electronics must be installed vertically. The electronics may not be installed in the rain without protection.

At most, 1000 W in peripherals may be connected for each connected side. Every side is fused with a 5 x 20 mm 5 A/250 V (delay) fuse. A higher rated fuse may never be used when the fuse is replaced.

New electronics:



Enable Ilex 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:



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

Press on the 2 AUT buttons to start the system.



Ilex Filtration Biodrum 20 +31384447366

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.

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.



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 Makoi Pond filtration Controller.



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

Manual flushing Ilex Controller



If you keep this 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).



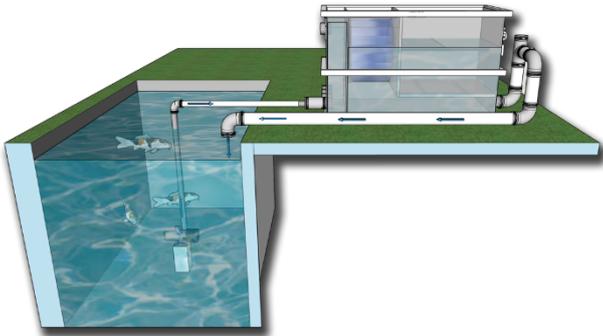
The float switch must be in the top position with gravity systems (with pump fed in the bottom position) otherwise the system will not switch on to prevent the pond pump from running dry.

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



7.3 Connecting a pump-fed system

The SuperDrum Combi Bio can also be connected as a pump-fed system: the water is pumped into the filter by the pump. Openings that are unused must be plugged.

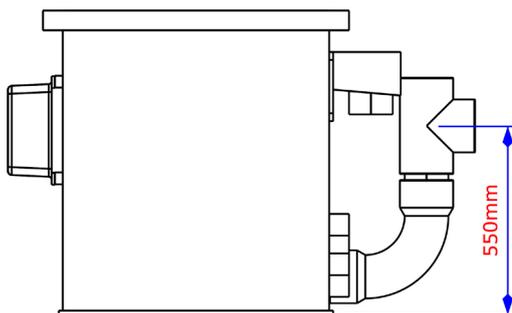


7.3.1 Float installation

You must install the float in front of the drum section for this (at the inlet). Additional holes have already been provided in the housing for an easy installation.

Attention:

The float must be installed upside down because the switching will also work in reverse order. If the water now rises in front of the drum filter, it will be contaminated and the rinse cycle must be activated. If now the highest float goes up in the upside down state, the system must switch off because, if not, the water will flow directly to the drains and your pump will be pumped dry via the rinse duct. The safety float must therefore be installed at the correct height in such a way that the system switches itself off before the water overflows into the rinse duct.



As extra protection, the 2 plugs of the top plugged holes can be removed so that the water flows further unfiltered during an emergency and there is no risk that water is pumped directly into the rinse duct.

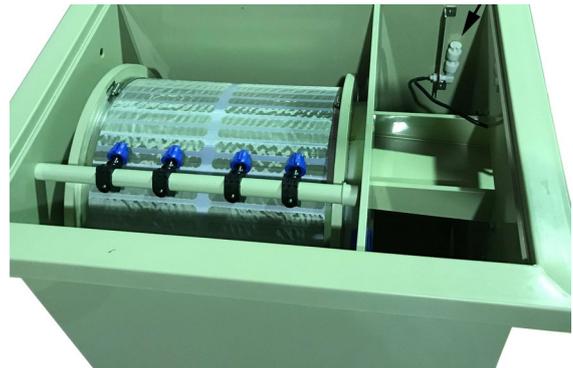
7.3.2 Connecting the pond return

The return to the filter must first go up to determine the required height within the filter.

This should not be too low because of the present biofilter material. It may not be too high either because then the rinse frequency of the filter will become too high.

The drum must also be aligned when in operation. A rinse cycle must be started when the water level difference before and after the drum is approximately 8-10 cm. Ensure that the vertical part stays open when up so that there is no siphoning and that the drum filter is suctioned dry because of it.

If you want to pump more water than 1x 110mm pipe can handle at gravity, you need to make extra passages. You can also connect the return to the



pond with a larger diameter pipe.

8. Maintenance and cleaning

The SuperDrum Combi Bio requires little maintenance. The following maintenance and checking activities are, however, required to ensure a good operation:

- Check the correct operation of both floats on a monthly basis.
- Perform a manual rinse and check whether the nozzles are spraying correctly on a monthly basis. A nozzle can be clogged or limescale may build up. The waste pump may also supply less pressure. If required, clean the nozzles.
- Clean the sieve element as required using a strong acid (30-35% hydrochloric acid). A biofilm or limescale may build up in due course, which means that the rinse frequency will increase significantly. Observe the safety instructions when cleaning using acids. Use protective clothing and safety goggles.

Technical Information

Capacity drum filter: 20 m³/uur
Effective space bio chamber: 110 Liter
Flush pump: Oase ProMax Garden Classic 3000
Pressure: 4.1 bar
P: 600W
Q_{max}: 3000 l/u
U: 220-230V/50-60Hz
Sieve mesh: 60 micron

Ilex Filtration Biodrum 20 +31384447366

Electronica: Filtreau IP54

Max. power pro side: 1000W
U: 220V/50-60Hz

10. Distributor's declaration

For claims against Ma-koi with regard to the products in this manual, in addition to what is stated in this manual, the general terms and conditions of Ma-koi apply.
Specifications may vary due technical improvements.

If the device fails to meet the high demands you expect from Ma-koi, please contact the dealer from whom you purchased your SuperDrum Combi Bio.

If you have any questions or problems, consult your dealer or Ma-koi.

10.1 Distributor

Ma-koi
Duurzaamheidstaat 19
8094SC Hattemerbroek
+31384447366