Technology You Can Afford.
Quality You Can Trust.

Operating Manual

Rotary Drum Filter

Model:
KC10
KC30
KC60

Koi-Collection Indonesia
Jl. Raya Parpostel 96
Jati Asih, Bekasi 17423 Indonesia

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uci@koi-collection.com

1. Introduction

Congratulations to your new Rotary Drum Filter (RDF).

To make sure that your RDF works properly it is essential that you read this manual carefully.

Please follow exactly all instructions, hints and information to avoid any problems with the operation of the RDF.

Should any questions or problems occur which are not mentioned in this manual please contact your dealer.

2. Important Security Information And Warnings

This manual should be accessible at any time as it contains important information regarding the operation and installation, as well as for trouble shooting.

We recommend to keep a copy of this manual directly at the location of your filter, so that it is available for technicians etc., if necessary.

PLEASE NOTE!
Koi-Collection is not responsible for any damages of the RDF or injuries which occur due to neglect of the manual and the security notes and instructions contained in it.

3. General Information regarding the used Markings

You will find the following markings in this manual. These markings point to important information or contain warnings. The exact meaning are described below as follows:

	Important information that requires special attention.
	Danger due to electricity.
	Increased risk of damage/injuries for items or persons.

4. Manufacturer data

Koi-Collection Indonesia
Jl. Raya Parpostel 96
Jati Asih, Bekasi 17423
Indonesia

Tel./Fax: +62 (0)21 / 82433766

E-mail: uci@koi-collection.com
Web address: www.koi-collection.com

5. Information regarding your RDF model

You will find the indication/data regarding your model on the identification label on your RDF.

6. EG-Conformity Statement

CE

Manufacturer:	Koi-Collection Indonesia Jl. Raya Parpostel 96 Jati Asih, Bekasi 17423 Indonesia
Machine type:	Rotary Drum Filter incl. electrical control unit (Model on the ID label)
Guide Lines/Directives:	Machinery Directive EU 98/37/EC Low Voltage Directive 73/23/EEC

The manufacturer herewith confirms the conformity of the product described in this manual with the above mentioned security directives and regulations.

Jakarta, 1st August.2009

_____
Fauzia Latief (President Director)

7. Modifications of the RDF

Please note that any modifications on the RDF without written approval of Koi-Collection or an authorized dealer will result in the immediate expiration of the CE-sign. Furthermore Koi-Collection will not be responsible for any damages or injuries resulting from these modifications.

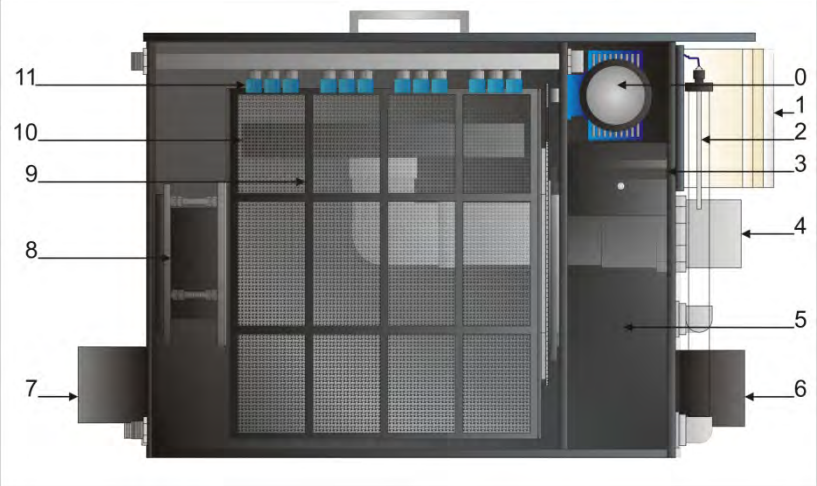
8. Spare Parts

Only genuine spare parts from Koi-Collection or an authorized dealer should be used. If spare parts from other suppliers/manufacturers are used, Koi-Collection will not be responsible for any damages/injuries.

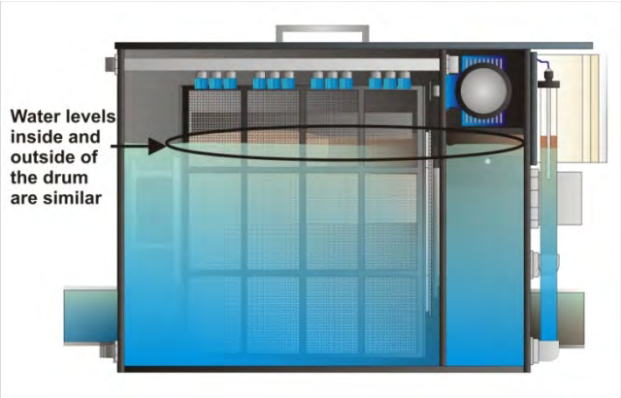
9. Description and Function of the RDF

A rotary drum filter (RDF) is a mechanical filter which removes waste and other fine particles from the pond water via a micro screen (filter screen). What makes the RDF so special is the ability to "monitor" the changes in water levels and "recognize" if the micro screen needs to be cleaned. Therefore a rotary drum filter automatically adjusts to the waste intake and only flushes if necessary. The other big advantage of RDF's is that all detritus such as fish waste, uneaten koi food etc. would not remain in the pond water. Instead all waste is flushed from the water column automatically after a very short period of time.

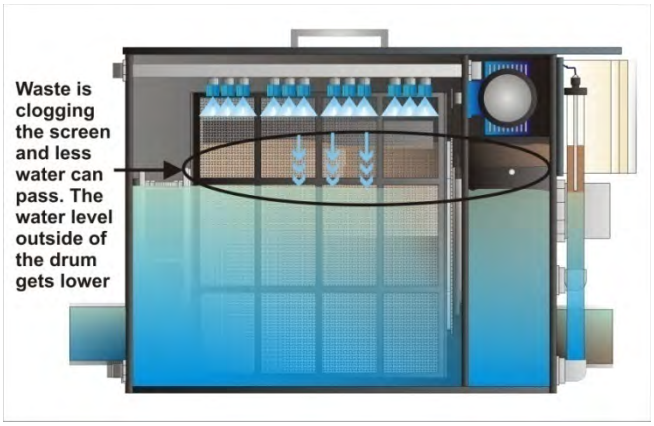
<u>The function principle of the RDF (gravity mode):</u>



0 – Gear Motor
1 – Control unit
2 – Sensor
3 – Adjustable Overflow
4 – Waste water outlet
5 – Collecting chamber
6 – Water Inlet
7 – Water Outlet
8 – Drum Tensioner
9 – Filter Drum
10 – Waste Water Tray
11 – Spray nozzles



The (contaminated) water is fed into the RDF via the water inlet (6). The water flows into the collecting chamber (5) and from there into the inside of the filter drum (9). The filter drum is covered with a fine filter screen (standard 40 micron/300 mesh). The (contaminated) water can only leave the drum by passing through the filter screen. All particles larger than 40 microns will remain inside the filter drum. The mechanically clean water leaves the drum filter's chamber via the outlet(s) (7) and can then pass onto the following filtration states.



The waste particles trapped inside the drum will slowly clog the filter screen making it mare difficult for the water to pass through it. Therefore the water level in the clean water chamber will slowly drop. Once the water level reaches a certain minimum level, which can be manually adjusted with the sensor (2) attached to the RDF, a flushing process is activated by the digital control unit. During the flushing process the drum (9) is rotated by gear motor (0) while high pressure water is sprayed onto the outside of the drum by multiple spray nozzles (11). The waste particles that were clogging the filter screen are flushed into a waste tray (10), positioned inside the filter drum, and leave filter via the outlet (4). The difference in water levels between flushing processes can be manually set by the sensor located an the outside of the filter. There is one sensor for gravity fed and another for pump fed systems. The flushing time can also be manually set with the digital timer an the control unit. Due to the use of the water level sensors the filter only flushes when necessary, i.e. when the waste intake reaches certain limits.

10. Transporting and moving the RDF

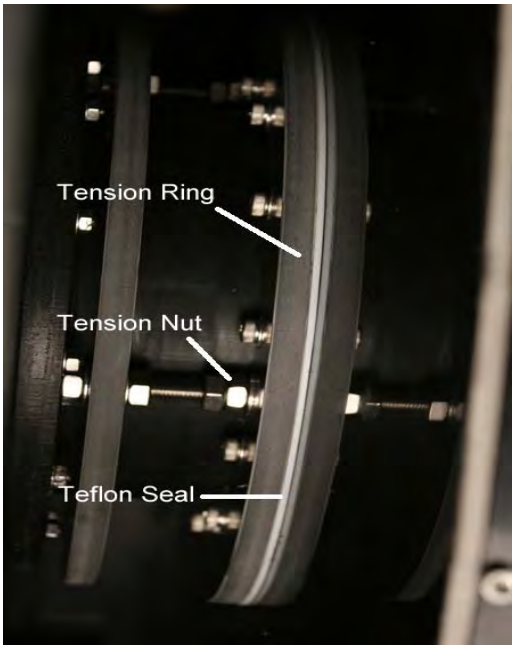
The RDF can transported/moved by or fork lift or similar devices while standing on a pallet. To move the filter by hand the inlet and outlet sockets can be used **(Please do not use the socket for the waste outlet!).**

11. Installation and Connection

The installation should only be executed by qualified personnel. We strongly recommend the installation and connection to be performed by your dealer!

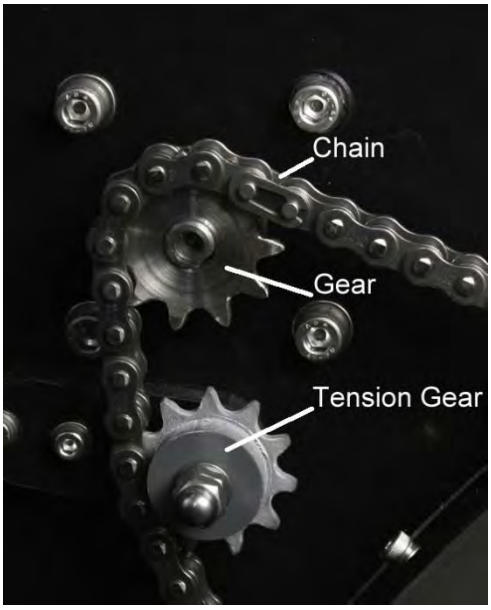
11.1 Before the installation

The RDF should be carefully inspected before the installation. Make sure that the packing and the RDF show no signs of any damage. Check the inside of the RDF and make sure that there are no remains or items in it.



Furthermore the proper fit of the Teflon seals between the drum and the tension ring has to be checked (no gaps). Should the Teflon seals be too lose the tension ring can be tightened (not too tight) via the tension nuts.

11.1 Before the installation (continued)



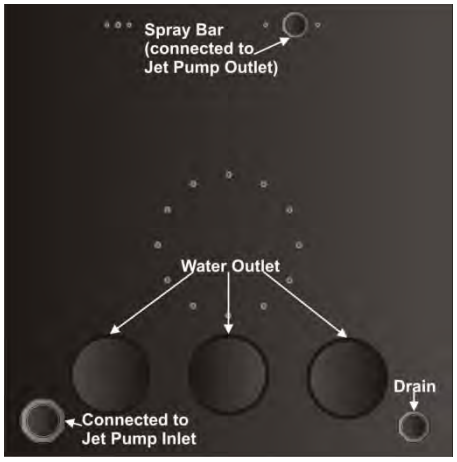
The correct fit of the chain and the drive gear of the motor should also be checked. Should the chain be too loose or too tight you can adjust the chain with the tension gear.

In case of any damage please inform your local dealer immediately!

11.2 Installation and Connection

The RDF needs to be placed on a solid and flat surface. When the filter has been placed at the desired location it needs to be set straight by using a spirit level.

The RDF needs to be placed at a proper location and <u>it must not be exposed to direct sunlight.</u> The RDF has to be protected against freezing. Please make sure that the filter is protected against temperatures below -20 deg. Celsius (-4 deg. Fahrenheit). If the temperature might become lower the RDF needs to be covered accordingly.

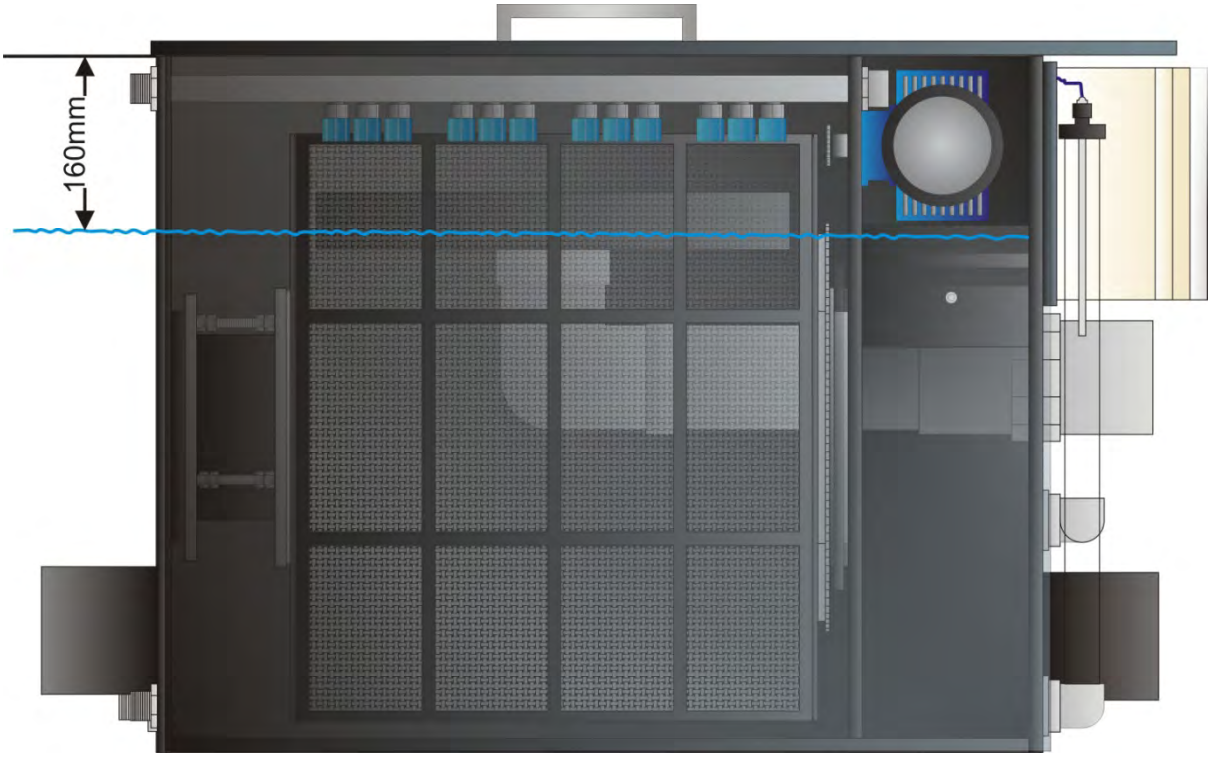


After that all inlets and outlets have to be connected to the sockets on the RDF. Make sure that the connected pipes do not create any mechanical load or tension onto the RDF casing. The connecting pipes should be as straight as possible (use as less elbows as possible). The pipe sizes should suit the desired flow rates.

The pipe for the waste water should be installed with a decline of min. 1%.!

11.3 Installation level of the RDF (gravitation system)

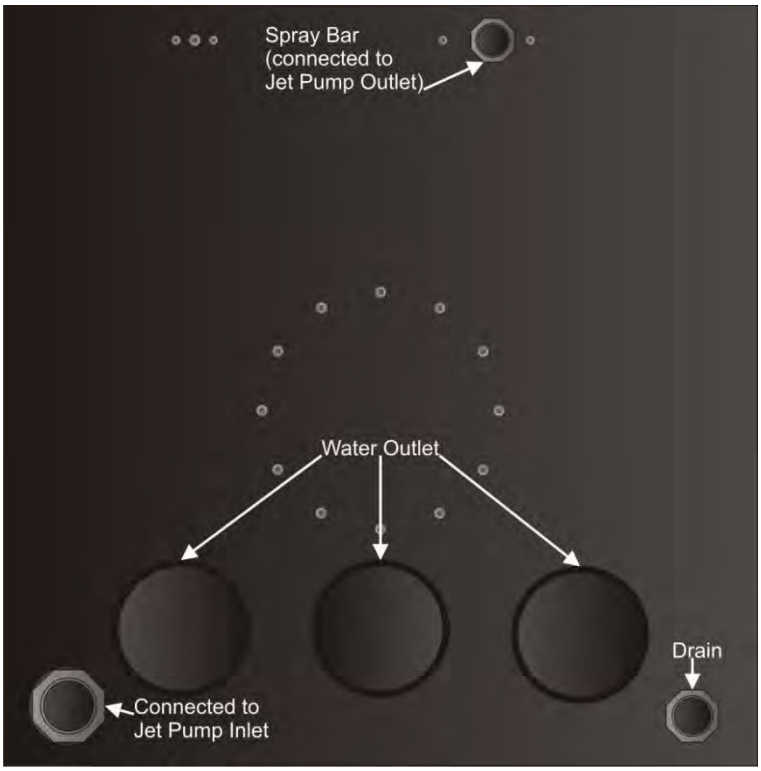
The standard installation level of the RDF is 160mm above water level (top of the casing needs to be 160mm above water level). This is the optimum height if all relevant parameters are correct. As conditions on every pond may vary (piping, flow rates etc.) the following instruction is only a general advise. Should the water levels change too much after the installation, so that the water reaches the overflow or the waste water tray before the flushing starts, the sensors and/or the flushing time will have to be adjusted accordingly (longer flushing, less level difference). Should the sensor and/or flushing time adjustments still not solve the problem the RDF needs to be installed higher.



The water level in the filter **with pumps off** should be **150mm** below the upper edge of the filter casing (**cover open**).

When pumps are running the adjustable overflow can be set 5 mm above the water level.

11.4 Connection of the flushing pump



The jet pump can be either connected with pipes or suitable high-pressure hoses. The water inlet of the spray bar has a ¾ inch connector. A hose adaptor or pipe socket can be connected to it. The water outlet of the jet pump is connected to the spray bar.

The water inlet of the jet pump is connected to the 1¼ inch connector at the bottom of the drum chamber. This makes sure that only pre-filtered water is fed into the pump and the spray nozzles won't get clogged.

To connect the outlet of the flushing pump a connector for a water hose or pipe needs to be fitted at the nozzle bar.

11.5 Power connection

The control unit is completely assembled and fitted onto the casing of the RDF. To connect the control unit simply put the plug into a plug socket. The plug of the flushing pump needs to be put into the blue socket on the control unit. Before connecting the plugs please make sure that all casings of the control unit are properly closed.

Before start-up and connecting the plug make sure that the emergency stop button is pushed and the power supply is interrupted until start-up.

PLEASE NOTE:
The control unit is completely installed and ready-to-use. However it is recommended that a qualified electrician re-checks the power connection. We also recommend to connect the control unit to a FI-switch for further safety.

12. Start Up

12.1 Before start up

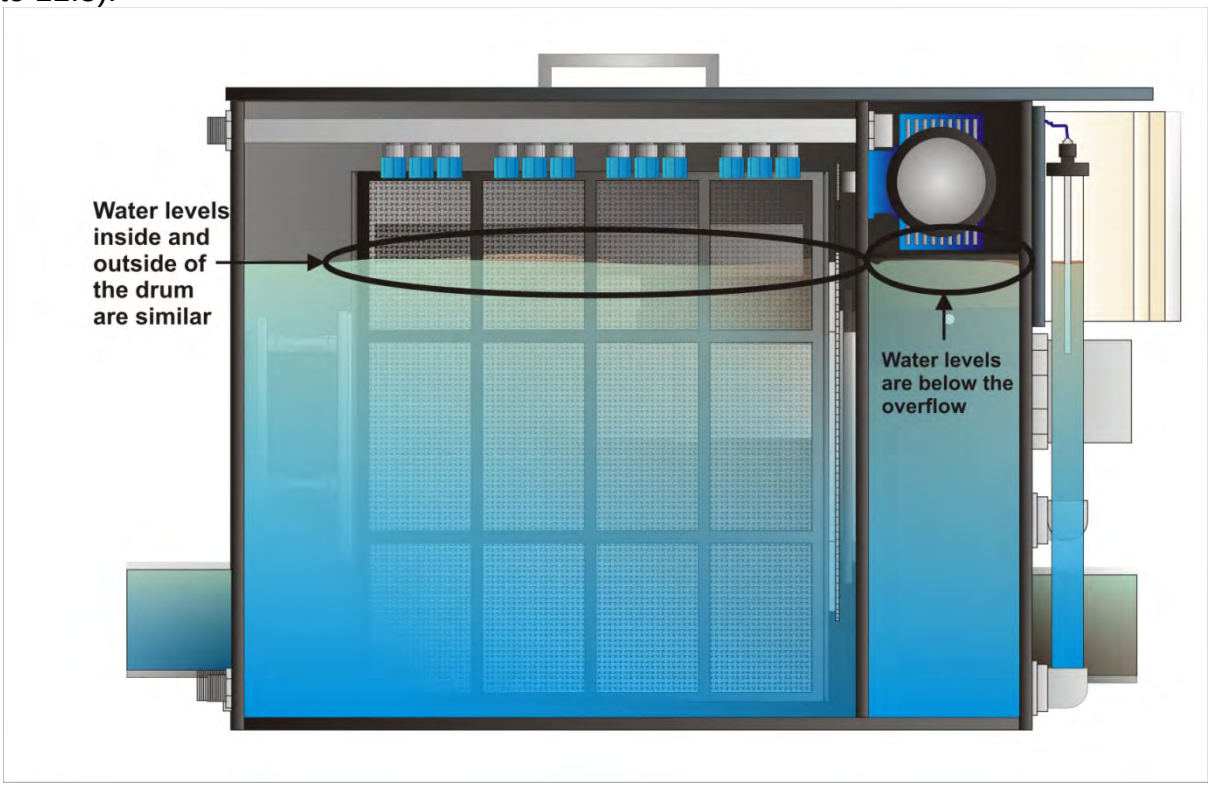
It is important to re-check all relevant points again. This includes:

-Checking all connections (correct position, no leakages etc.)
-Checking all safety devices (Motor cover etc.)

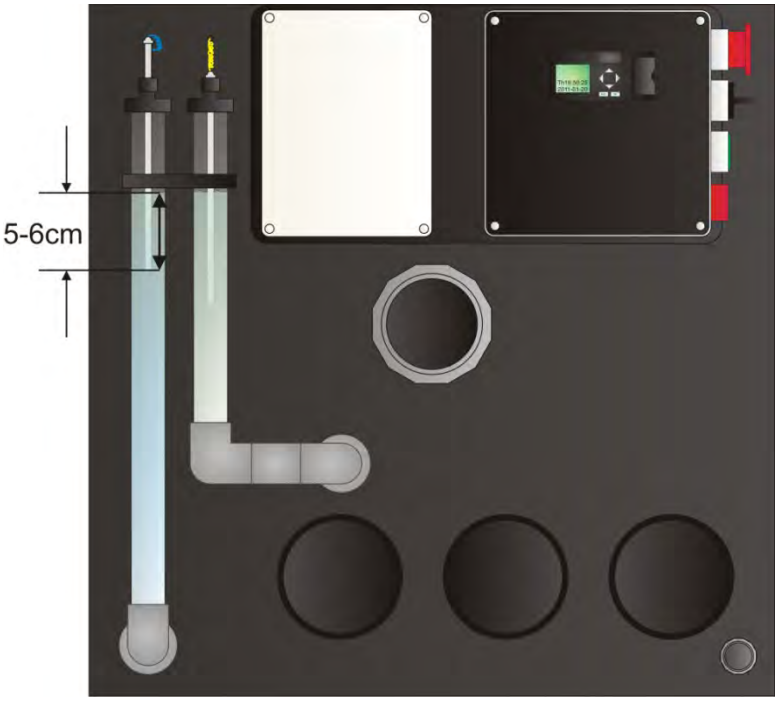
12.2 Start up (Gravitation system)

This chapter is important if you have installed your RDF as a gravitation system. If this is not the case and you have installed your RDF in pump fed mode please continue under 12.3.

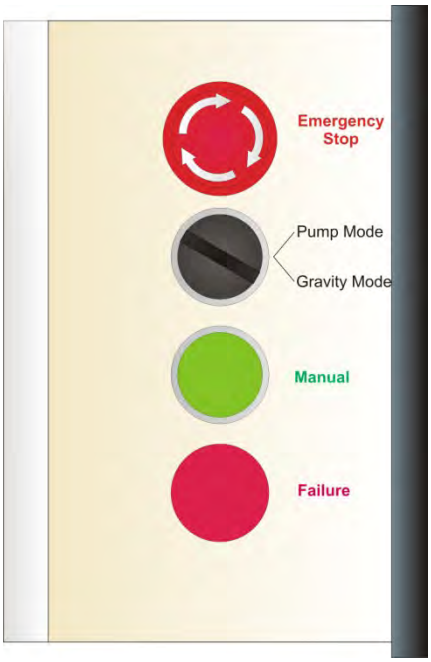
Make sure that all pumps etc. are turned off and the pond system is on “stand-by“. Open all cranes gate valves etc. If there are any cranes installed at the flushing pump, they need to be opened as well. After the water level has set in the RDF (the level in the collector chamber and the filter chamber have to be the same) the water level has to be below the edge of the overflow in the collector chamber (please refer to 11.3).



12.2 Start up (Gravitation system) continued



Now adjust the sensor on the left side (blue cable) until it is submersed by approx. 5-6 cm. The sensor operates with 24V low-voltage and gives the signal for flushing if it has no water contact anymore. The sensor should not be submerged more than 10cm. If the sensor is in the correct position it can be tightened with the screw on the cap. Depending on the water levels in your pond system and the RDF the sensor can be cut to the correct length to avoid that it touches the cover.



Set the black switch on the control unit to the position „Gravity Mode".

Turn the control unit on by turning the red emergency-stop-button (**the pumps of your pond should still remain turned off at this stage!**).

12.2 Start up (Gravitation system) continued

Open the cover of the RDF and push the green button for the manual flushing (because the cover is open the drum will not turn). Check that the flushing works and the nozzles are not plugged. If you find plugged nozzles push the emergency-stop-button and remove the nozzles from the nozzle holder by turning them counter-clock-wise (¼ turn). **Be careful when taking out the nozzles and make sure the seals do not fall into the RDF**.

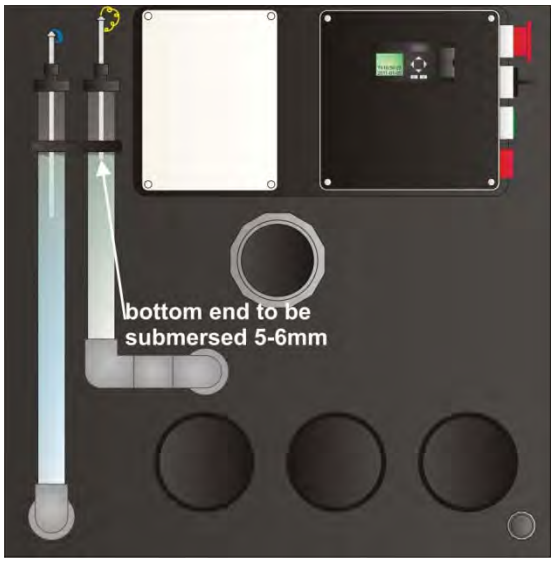
Clean the nozzles and put them back in position. Turn the control unit on again by turning the emergency-stop-button.

Turn on the water pumps of your pond and check if the cleaning and flushing process works and the filter operates according to its application. Depending on the flow rates of the water pumps and changes in water levels you might have to re-adjust your sensor again.

After flushing please check the position of the adjustable overflow. The top of the overflow should be positioned 5-10 mm above the water level.

<u>Automatic water re-fill:</u>

The KC series RDF is equipped with a sensor that can control a 24V solenoid valve/magnet valve (not included) to automatically re-fill the pond water and keep the water in the pond at the same level. The solenoid valve has to be connected to the corresponding cable on the control unit (cable with a white connector)



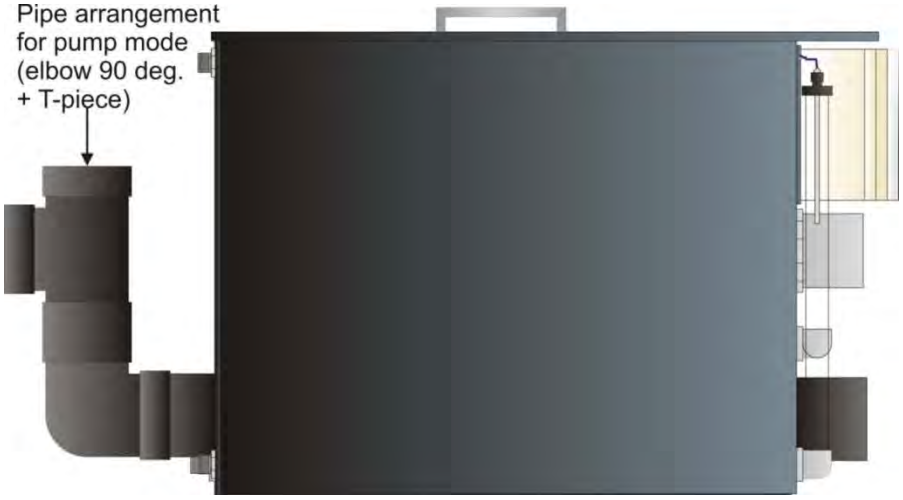
The sensor needs to be submerged only about 5-6mm. The sensor will open the solenoid valve once it has no water contact for more than 20 seconds (the time can be changed on the control unit) and close it once the water level has reached the sensor again.

PLEASE NOTE: If you do not use automatic water re-fill it is very important that the water level in the pond does not get too low. If the water level gets too low it is possible that the water cannot touch the sensor anymore. In that case the RDF will not stop flushing and the control unit will switch to failure mode after a certain time to protect the RDF and the components (motor, trafo, jet pump etc.)

12.3 Start up (Pump fed mode)

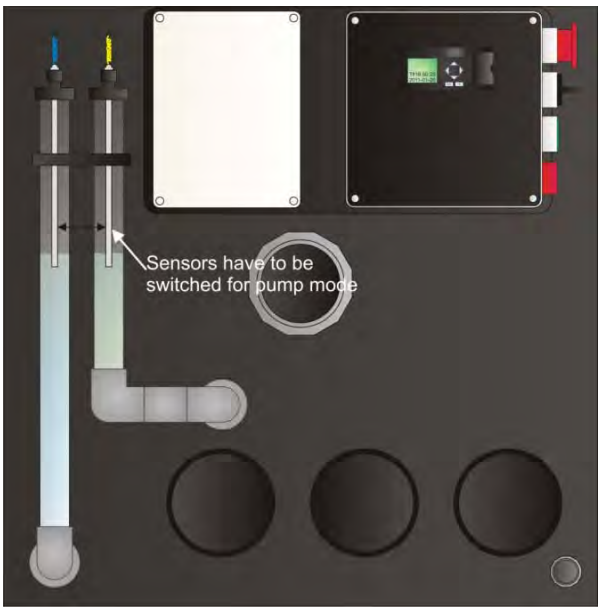
IMPORTANT NOTICE FOR OPERATION IN PUMP FED MODE: The connections on the inlet side will need to be reduced to the size of your pump outlet(s). Any inlets which are not used will need to be closed with caps!

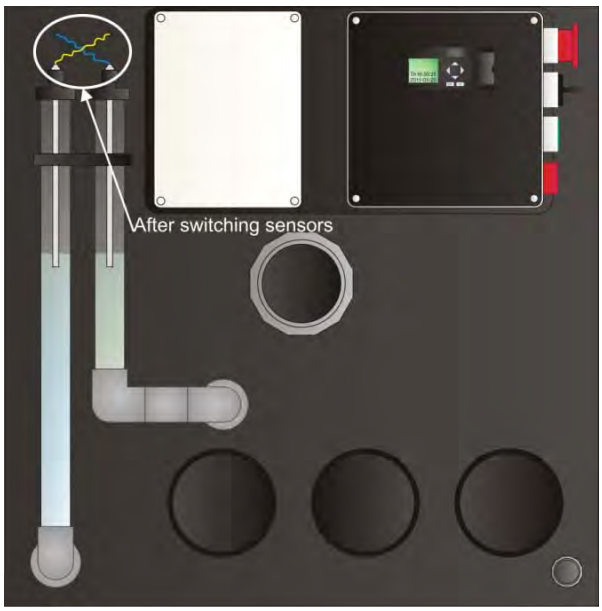
The outlets of the RDF have to be raised with T-pieces so that the bottom of the outlet(s) are at least at the same level like the waste water outlet! This makes sure that the filter chamber does not get entirely empty during a power failure. Furthermore critical differences in water levels inside and outside of the filter drum are avoided.



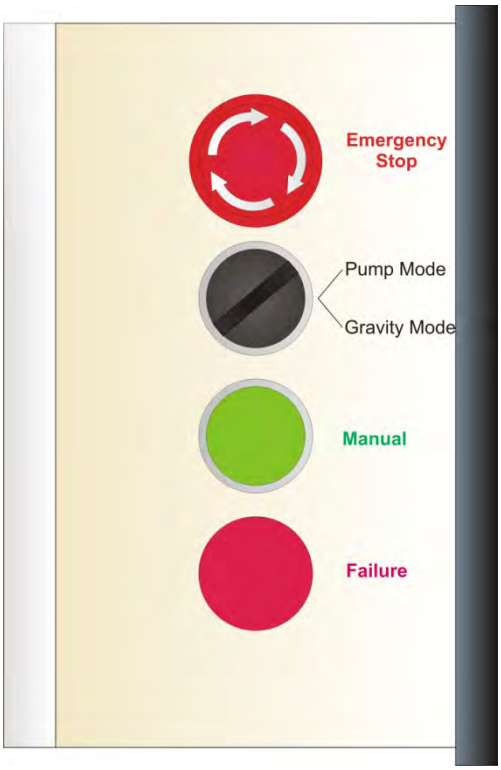
Turn on the water pump(s) of your pond and wait until the water comes out from the outlets of the filter. Turn the pumps off again.

Switch sensors (the blue cable sensor from left to right, the yellow cable sensor from right to left).





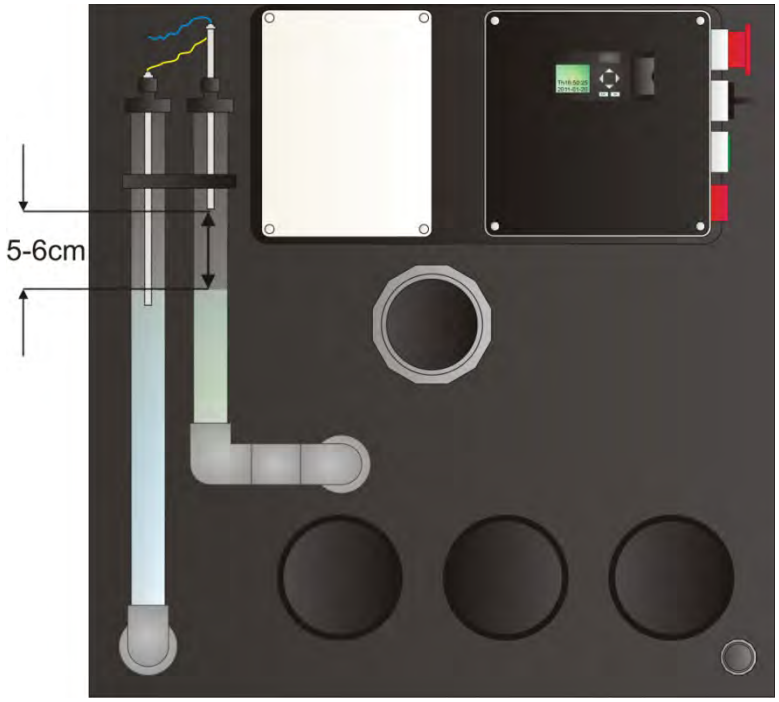
12.3 Start up (Pump fed mode), continued



Set the black switch on the control unit to the position „Pump Mode".

Turn the control unit on by turning the red emergency-stop-button (**the pumps of your pond should still remain turned off at this stage!**).

Open the cover of the RDF and push the green button for the manual flushing (because the cover is open the drum will not turn). Check that the flushing works and the nozzles are not plugged. If you find plugged nozzles push the emergency-stop-button and remove the nozzles from the nozzle holder by turning them counter-clock-wise (¼ turn). **Be careful when taking out the nozzles and make sure the seals do not fall into the RDF**. Clean the nozzles and put them back in position. Turn the control unit on again by turning the emergency-stop-button. Turn the pump(s) on.



Now adjust the sensor on the right side (blue cable) until it is approx. 5-6 cm above the water level. The sensor operates with 24V low-voltage and gives the signal for flushing if it has water contact. The sensor should not be raised more than 10cm above water level. If the sensor is in the correct position it can be tightened with the screw on the cap. Depending on the water levels in your pond system and the RDF the sensor can be cut to the correct length to avoid that it touches the cover.

Check if the cleaning and flushing process works and the filter operates according to its application. Depending on the flow rates of the water pumps and changes in water levels you might have to re-adjust your sensor again.

12.5 Start up – Setting Parameters

The following parameters can be adjusted on the control unit:

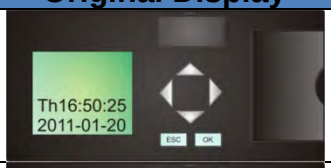
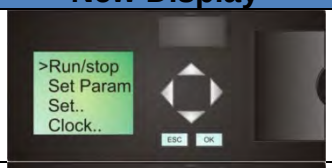
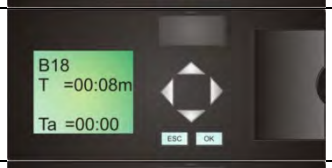
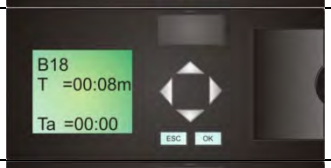
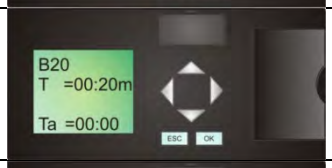
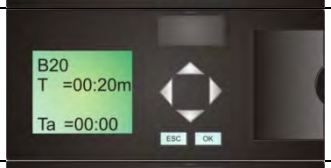
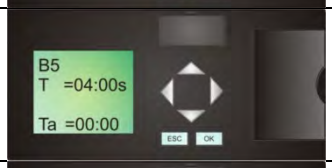
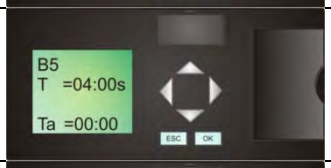
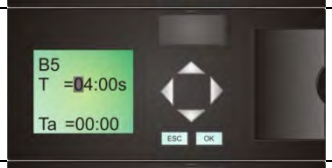
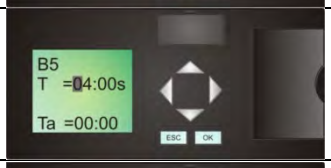
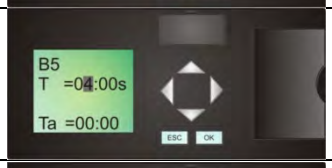
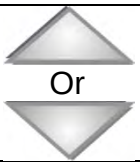
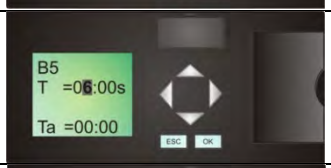
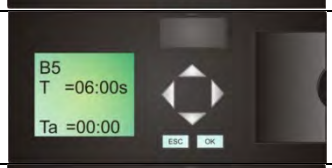
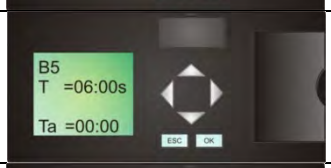
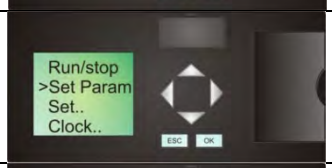
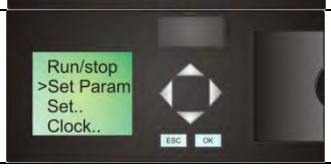
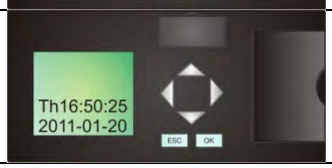
-Flushing time (=**B5** at the PLC unit), **pre-set to 4 seconds**

-Flushing time after 1 hour in case the sensor did not trigger flushing due to low waste intake (maintenance flushing), (=**B18** at the PLC unit), **pre-set to 8 seconds**

-Hysteresis (time between the sensor got no water contact and the signal to open the solenoid valve) to re-fill fresh water (=**B20** at the PLC unit), **pre-set to 20 seconds**

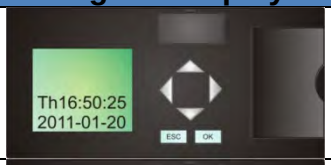
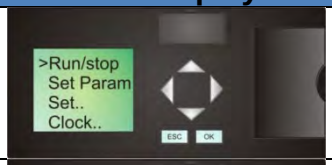
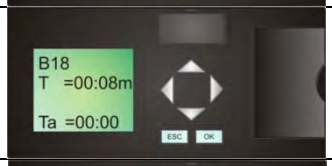
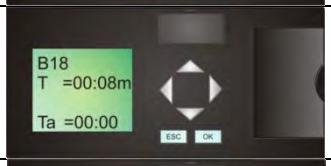
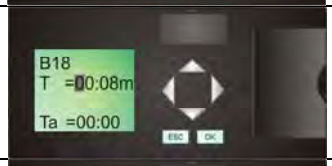
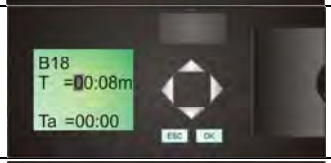
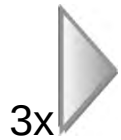
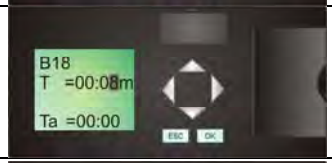
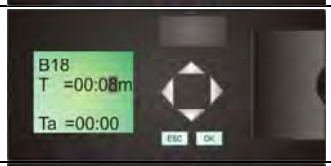
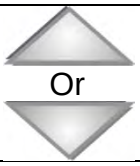
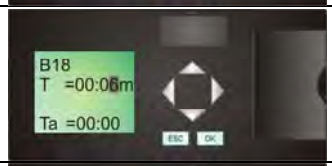
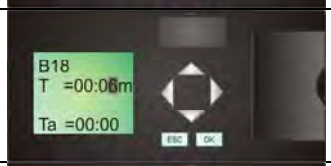
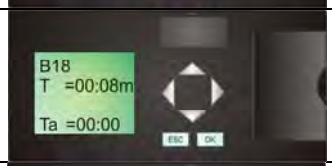
The details how to change the parameters are described on the following pages.

Setting the flushing time (B5):

Original Display	Press	New Display
	ESC	
		
	OK	
		
		
	OK	
		
		
	OK	
	ESC	
	ESC	

12.5 Start up – Setting Parameters (continued)

Setting the maintenance flushing time after 1 hour (B18):

Original Display	Press	New Display
	ESC	
		
	OK	
	OK	
		
		
	OK	
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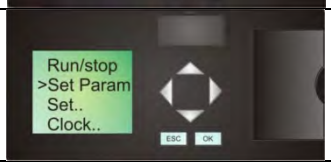
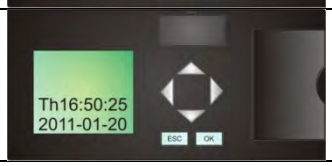
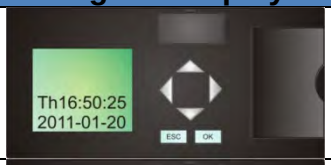
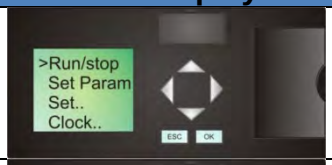
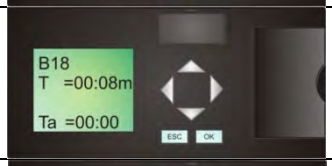
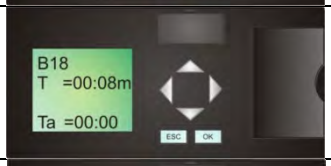
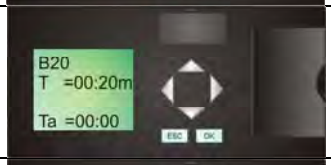
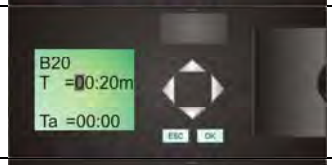
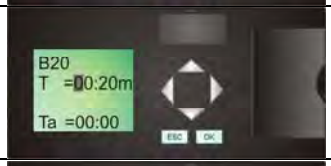
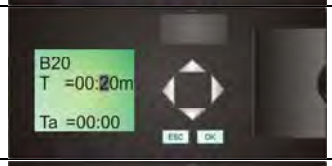
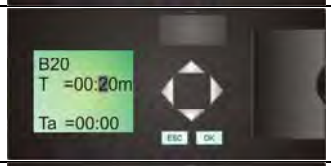
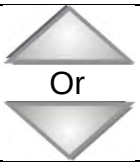
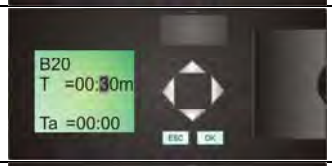
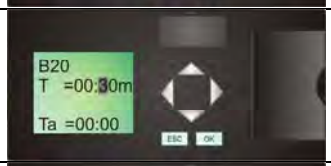
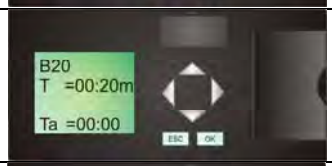
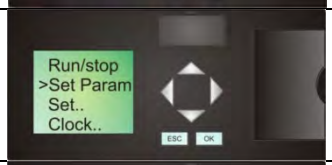
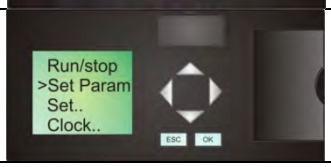
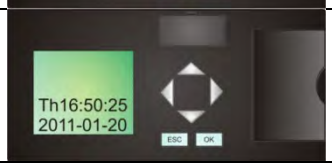
	ESC	

12.5 Start up – Setting Parameters (continued)

Setting the hysteresis for the re-fill (B20):

Original Display	Press	New Display
	ESC	
		
	OK	
		
	OK	
		
		
	OK	
	ESC	
	ESC	

12.5 Start up – General information

On new ponds it is possible that the spray nozzles get plugged more often during the start up period (approx. 1-2 weeks) because the pond and chambers might still contain waste from the construction.

In the first days after the start up it is recommended to check the nozzles on a daily basis and clean them if necessary.

After the start up please make sure that the flushing starts before the water reaches the overflow or waste water tray inside the drum. If necessary the sensor has to be re-adjusted so that the level difference between collector chamber and filter chamber is lower (in gravitation mode the sensor needs to be raised a little, in pump fed mode the sensor needs to be lowered a little).

After approx. 2 weeks the flushing frequency should be checked. In „clean“ ponds the time between 2 flushing modes should not be less than 15 minutes. If the flushing frequency is too high (less than 15 minutes between 2 time flushing) the flushing time or the sensor level difference can be increased. If you face problems with the setting or flushing times please contact your local dealer.

13. Maintenance

Before doing any maintenance works the emergency-stop-button has to be pushed and the plug of the control unit has to be removed from the plug socket! Failing to do so might result in damages or injuries!

13.1 Spray nozzles

It might happen that one or more nozzles get plugged. This results in a poor cleaning of the filter screen and a higher flushing frequency. Should a nozzle be plugged you can clean it with a tooth brush.

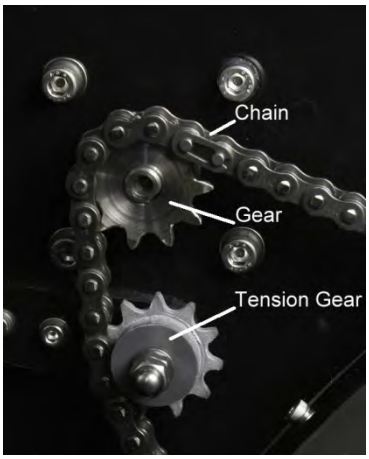
Please do not use any hard or sharp objects like cutter knifes or steel brushes as they would damage the nozzles.

13. Maintenance (continued)

13.2 Chain and drive gear

The chain and the gear are made of stainless steel and do not require any maintenance. An elongation of the chain can be expected only after many years of operation as the mechanical load is very low.

13.2 Chain and drive gear (continued)



If the tension of the chain should be too low it can be adjusted with the tension gear.

13.3 Filter screen

Should the filter screen be torn or damaged it can be changed easily. To change the screen the fixing screw of the drive gear has to opened so that the drum can move freely. After that the screws of the outer support mesh can be opened and the mesh including the filter screen can be removed.

The spare filter screens of Koi-Collection are supplied with a separate manual and can be installed easily.

When the new screen is installed and all screws of the support mesh are tightened the drum has to be turned so that the gear reaches the correct position on the pivot rod (screw above the „flattened“ part of the rod) the fixing screw of the gear can be tightened again.

14. Technical Specification

	KC10	KC 30	KC 60
Dimensions Casing (without cover and connections):	Length: 454mm (17.88 inch) Width: 504mm (19.84 inch) Height: 510mm (20.10 inch)	Length: 765mm (30.12 inch) Width: 604mm (23.78 inch) Height: 610mm (24.02 inch)	Length: 1005mm (39.57 inch) Width: 754mm (29.69 inch) Height: 760mm (29.92 inch)
Dimensions Filter Drum:	Dia.: 400mm (15.75 inch) Width: 204mm (8,03 inch)	Dia.: 500mm (19.69 inch) Width: 454mm (17,87 inch)	Dia.: 650mm (25.59 inch) Width: 674mm (26,54 inch)
Surface area filter screen (gross):	0,226 m² (2,43 square feet)	0,675 m² (7,27 square feet)	1,327 m² (14,28 square feet)
Surface area filter screen (net):	0,205 m² (2,21 square feet)	0,586 m² (6,31 square feet)	1,134 m² (12,21 square feet)
Mesh size filter screen:	Mesh/micron: 300/40	Mesh/micron: 300/40	Mesh/micron: 300/40
Max. Flow Rate:	10 m³/h (2,630 gallons/hour)	30 m³/h (7,895 gallons/hour)	60 m³/h (15,790 gallons/hour)
Dimensions Inlet and Outlet:			
Inlet:	1 x 110 mm (4 inch)	3 x 110 mm (4 inch)	2 x 160 mm (6 inch)
Outlet:	1 x 110 mm (4 inch)	3 x 110 mm (4 inch)	2 x 160 mm (6 inch)
Waste Water Outlet:	1 x 90 mm (3 inch)	1 x 90 mm (3 inch)	1 x 90 mm (3 inch)
Connection jet-pump:	1 inch	1 1/4 inch	1 1/4 inch
Connection spray bar:	3/4 inch	3/4 inch	3/4 inch
Motor:	Wiper Motor 18 Watt	DC Motor 60 Watt, 3150 rpm, Torque 15 Nm (132 lb/in) with worm gear box and thermo switch	DC Motor 120 Watt, 3050 rpm, Torque 20 Nm (117 lb/in) with worm gear box and thermo switch
Electrical Supply Sensor/Motor:	24 Volt / 24 Volt		
Classification Control Unit Casings:	IP66		
Classification Buttons/Switches Control Unit:	IP65		
Installation Height above water level:	160 mm (6,3 inches)		
Electrical Supply Control Unit:	220V / 50Hz (standard model) 110V / 60 Hz (US model)		
Power Consumption Control Unit (standby):	Approx. 25 Watt		
Materials of Construction:			
HDPE:	Casing, Filter Drum, Support Screen, Waste Water Tray etc.		
Stainless Steel:	Micro Screen, Drive gear, Chain, Screws, Motor Pivot Rod		
Teflon:	Bearing seals		
PVC:	Waste water pipe, Drum gear, tensioner		
Aluminum:	Edge Protectors of the casing		
PP:	Spray Nozzles		