

## TROUBLE SHOOTING

### DECREASE IN WATER FLOW

1. If you notice that your water flow is decreasing the most likely cause is that the filter needs to be backwashed. The bead filter is designed to trap solids and does it very well. When fully loaded with solids, the filter may restrict flow. Perform a backwash.
2. If after backwash the filter the water flow is still low, next check the strainer Basket on the pump. Be sure that it is clean and replace. Check to see if the laterals are clear of obstruction and that the beads are not caked into large clumps. When the bead pack gets "gelled" they are hard to break apart with backwash. They may need to be manually broken apart. When the beads are gelled they tend to cause "Channeling," which means that the bead pack is totally clogged and water will follow paths of little resistance. Through or around the bead pack. When channeling is occurring you will notice that after backwash the filter quickly clogs and flow slows in intervals that used to take 1-2 weeks, now flow slows in 2-3 days. Follow the directions in the internal inspection section of the filter operation section of the manual.
3. If you follow the above steps and your flow is still low, PLEASE, call your dealer.

### TROUBLE SHOOTING DECREASE IN WATER CLARITY

1. If your filter has a mature bacterail colony, which could take up to 4-6 weeks at temps. above 60-65 degrees F., and your water quality and clarity have been good then decreases, the first thing to do is a good backwash and rinse. Spend an extra amount of time with the blower agitation of the beads.
2. If your clarity does not improve or improves then decreases quickly, open the filter and inspect the internal condition of the laterals and the beads. If the beads are gelled and channeling is occurring, then the water will bypass most of the bead pack and no mechanical filtration will occur. Manually break up the beads and make sure the laterals are clear of obstruction.
3. If your clarity does not improve, check the water flow out of the system. The entire pond water volume should be turned over through the filter system at least 3-4 times per day. If turn over time is slow then the amount of solids that the filter can capture will decrease. Check to make sure that there are no flow restrictions. Follow the low flow trouble-shooting chart. Also make sure that your pump is large enough to move the amount of water needed for enough turn over through the filter.
4. If after following the above suggestions and the clarity is still off, PLEASE call your dealer.



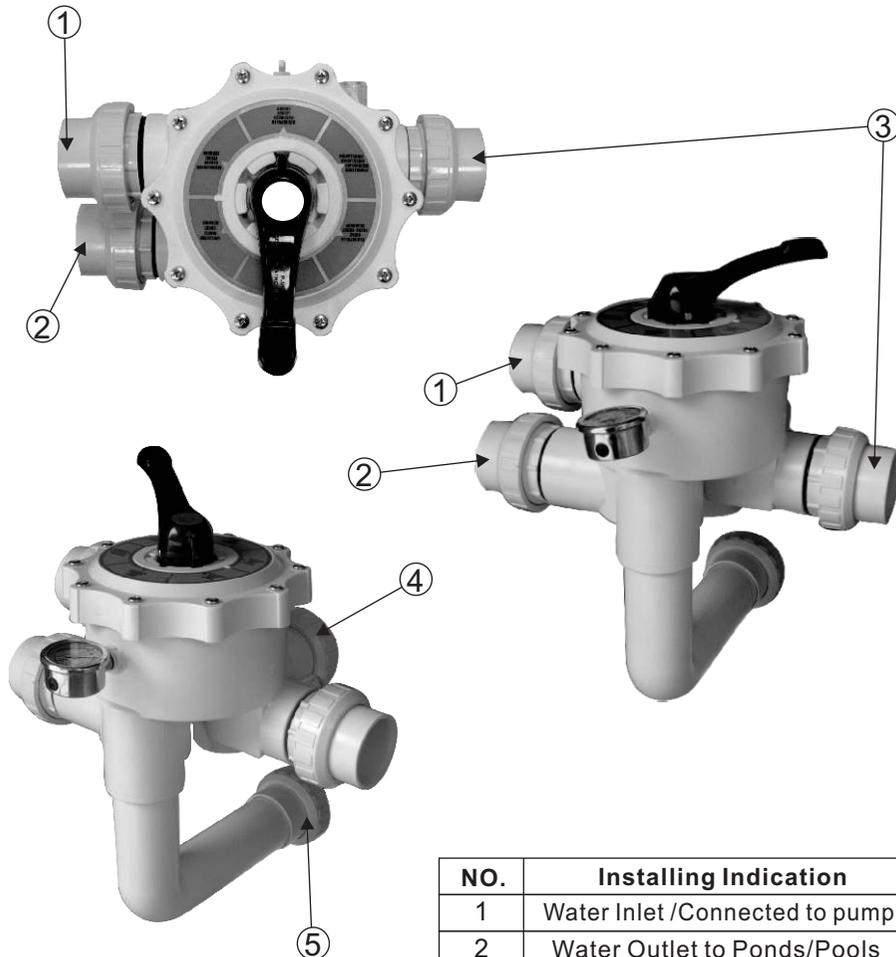
**MINDER®**  
SWIMMING POOL, SAUNA, FOUNTAIN

## *uf - ms series bead filter*



**instruction manual**

## installing indication of multi-port valve



NO.	Installing Indication
1	Water Inlet /Connected to pump
2	Water Outlet to Ponds/ Pools
3	Waste Outlet
4	Water Outlet from tank
5	Water Inlet to tank

## High Ammonia and Nitrite with previously Stable State

If your pond has been opening and running at warm temperatures (60-70 F) for six or more weeks and your ammonia and nitrite levels have been previously controlled, but you experience a spike in the ammonia level try the following:

1. Ad or increase dosage of your pump's intake. MINDER liquid bacteria blend by applying it to your pump's intake.
2. Perform an extra long backwash. If the bead pack becomes totally clogged with solids, the available surface area for bioconversion drops significantly. Backwash will open up the active surface area and bio conversion will resume.
3. If after backwashing the ammonia levels are still high, open the filter. Check the laterals to make sure they are clear, stir the beads to break up any gelled areas and then backwash.
4. If ammonia levels are still high, consider how much food is being fed to the fish. One cubic foot of mature beads can handle around one pound of 35% protein food per day. Check to see how many cubic feet of beads are in your filter and compare that with how much food your feeding.
5. If ammonia levels are still high, check the flow rate through the filter. The entire volume of the pond should be turned over through the filter 3-4 times per day. If the flow is down for some reason, bioconversion of ammonia will also slow. If you find the flow is in fact down, follow the trouble shooting flow chart for correcting low flows.
6. If all the above are found to be in good condition, consider the fish load on the pond. This actually also relates to the above discussion about amount of food fed. If you have a heavily stocked pond you will also be feeding more to the fish and thus adding more nitrogen to the pond water that will have to be bio-converted. Again, consider your filter size and what you expect it to do.
7. If the ammonia levels are still high, call your dealer.

### MEDICATING YOUR POND

Sometime during your career as a pond keeper you may need to medicate your pond with chemicals that will harm the bacterial colonies on the filter media. To insure that they are not damaged follow these simple steps:

1. Do a good backwash on the filter then turn off the pump.
2. Move the valve to the "recirculate position". This will cause the water to bypass the filter while treating your pond. Turn your pump on.
3. Open the drain plug at the bottom of the filter. Water will start draining out of the filter without loss of any beads. The bead pack will now be surrounded with air instead of water. This will prevent any bacterial loss from lack of oxygen. The beads will stay moist for several days.
4. When the medication period is over, close the Drain Plug. Turn off the pump and move the handle to the "FILTER" position. Now turn on the pump. Open the AIR RELEIF vent until water squirts out – then close it. Do a backwash and rinse, then go to filter mode.

**\*Note\*** Depending on the chemicals used, it is advisable to do a 50% water change before starting the filter back up. Check with your dealer.

If you live in an area where you experience hard freezing, you may decide to shut your filter down for the winter. Do the following:

1. Do a good backwash of the filter.
2. Turn off your pump and open the drain plugs on the pump strainer basket.
3. Open the drain plug at the base of the main filter and Water will drain out of the filter, but no beads will be lost.

### IN THE SPRING:

1. Tighten all the connections that you loosened in the Fall.
2. replace the Bio-Balls and replace the lid
3. Move the multi-port valve to the filter position and close the drain plug. Turn on the pump. When water comes out of the air release valve at the top of the filter, shut it and turn off the pump. Now do a good backwash before going to the filter mode. Back up to full capacity. During the first few weeks of operation in the spring, it is a good idea for the pond owner to do frequent checks of the ammonia and nitrite levels.
4. Seed the filter with MINDER liquid bacteria blend by applying it to your pump's intake.

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### WHAT IS THE OPERATION THEORY OF BEAD FILTER?

**MINDER** Bead Vortex™ filters accomplish two goals, one being water polishing (solids capture) and the other being bio filtration. Water enters the MBV filter through vortex laterals that force the water to “spin” inside the fiberglass tank. Spinning water causes heavier solids to collect in the middle of the vortex where gravity forces the solids downward to a collection area where they can be easily and simply removed simply by opening the sludge valve. The light debris is forced upward into the bottom half of the **MINDER** Foam™ bead pack and Captured until the next backwash cycle. The advantage of the **MINDER** Bead Vortex™ filter is its exceptional solids capture and removal performance, but that it also provides high Specific Surface Area (SSA) for **MINDER** Clear™ Nitrification Cycle Bacteria all within the same vessel. The other main advantage the **MINDER** Bead Vortex™ filters have over other types of filters is that they are much easier to clean. This makes the hobby of KOI or pond keeping much more enjoyable, with less work involved in maintaining a healthy environment for the fish.

### HOW DOES PHYSICAL FILTRATION PERFORM?

Mechanical filtration or clarification is the process of removing suspended solids from water. Suspended solids in a recirculating system are generally small particles of sand, soil, un-eaten food, tree needles, and algae. These solids tend to reduce the clarity of water and cause problems in consuming tremendous amounts of oxygen, also needed by our beloved fish. **MINDER** Bead Vortex™ filters remove solids from water more efficiently than any other brand of bead filter by combining the power of a vortex with micro-straining with **MINDER** Foam™ Styrofoam beads. Physical straining in the vortex and the **MINDER** Foam™ bead pack is the most dominant mechanism for removing larger particles (>50 microns). Finer particles (<20 microns) are removed at a lower rate by a process called bio absorption. The particles are captured by bacterial bio film on the surface of the bead. Studies show that **MINDER** Bead Vortex™ filters capture 100% of particles >50 microns and 48% of particles in the 5-10 micron range per pass. The more passes, the more solids captured.

**\*\*Caution\*\*** in order for the **MINDER** Bead Vortex™ filter to perform FINE micron straining it MUST be fully colonized with nitrifying bacteria such as **MINDER** Clear™ Nitrification Cycle. Depending on the temperature this can take up to 4-6 weeks, at temperatures above 60-65 degrees F.

### HOW DOES BIO FILTRATION PERFORM?

Bio filtration depends on the establishment of a colony of bacteria such as **MINDER** Clear™ Nitrification Cycle on the surface of the beads large enough to convert dissolved toxic nitrogenous waste to harmless compounds. This is commonly referred to as SSA – short for Specific Surface Area. When the bacteria are living in the proper environment, they grow in a thin bio film on the surface of each bead. Each cubic foot of **MINDER** Foam™ beads contain about 884,000 beads ranging in diameter from 1/16 – 1/8 inch which translates into 452.20

### \* CAUTION\*

**•Always turn your pump OFF before changing positions on the Multiport Valve. Otherwise the pump's pressure can damage the internal gasket and result in leakage.** If you leave your filter unbackwashed for extended periods of time, and you live in an area with relatively soft water, you may want to buffer your pond water. The bacteria in the filter can consume enough alkalinity in the water to cause a dangerous pH drop. Total alkalinity should be kept above 80ppm to avoid potentially dangerous shifts. To increase alkalinity, add sodium bicarbonate, change the water, or add a commercially prepared pH Buffer.

### INTERNAL INSPECTION

We recommend that you should inspect the output laterals twice a season.

1. Backwash your filter then turn off the pump and leave the valve in the backwash position. Also open the drain plug at base of the filter.
2. open the top cap and remove, now inspect the beads. Do they look clean after the backwash? Are there areas of caked beads? If you find areas of dirty beads or caked beads, you may need increase the backwash time, or possibly the backwash frequency. If you find caked beads, now is the time to break them apart. Using your hand or a stick, stir the beads and break up any clumps that you might find.
3. Wipe any beads stuck to the output laterals off and inspect them. Make sure that they are clear of any obstructions. If there is material inside the laterals, they can be unscrewed and removed. A baby bottle brush cleaner works well for removing internally trapped solids. Back up when done.
4. Next, inspect the backwash laterals. They will need to be removed. This can be done by reaching down in the filter and unscrewing the union that holds the backwash lateral in place. When loose inspect them for debris. Clean if needed then back up when done.
5. Back the top cap up and make sure that it is secure.

depending on the setting on the multi port (FILTER), the water continues then to the pond.

## BACKWASH & RINSE INSTRUCTIONS

When you first start up your filter, we recommend that you let it run for two weeks before you perform your first backwash. After that, once a week during the warm season should be all that is needed. During the winter months backwashing can be reduced to as little as once every 2-3 weeks. To perform a backwash do the following:

1. With the pump running open the valve to the sludge drain (B). Keep it open for 15-20 seconds, then shut it. This will purge the large solids that have made it into the filter and settled out in the bottom of the tank to waste. It is very important to get them out of the system for overall water quality and more efficient filter operation. **\*IMPORTANT\*** Do not open the sludge drain valve with the pump off, as you may lose beads to waste if water is allowed to drain out this valve.
2. Turn the pump off, then move MULTIPOINT VALVE to the "BACKWASH" position and restart Your pump for 1-3 minutes until water is clear in sight glass. Turn off the pump again..
3. Move MULTIPOINT VALVE to "RINSE", restart pump and run for a short while until water is clear in sight glass. Turn the pump off again.
4. Move MULTIPOINT VALVE to "FILTER". Restart pump. Backwash & Rinsing is done.

square feet of SSA per cubic foot of **MINDER** Foam™ beads. The two specific types of bacteria are: Nitrosomonas, which is responsible for the break down of ammonia, and Nitrobacter, which is responsible for the breakdown of nitrite into relatively harmless nitrate. These two bacteria strains are the key ingredients in **MINDER** Clear™ Nitrification Cycle Bacteria. **\*\*Caution\*\*** in order for the **MINDER** Bead Vortex™ filter to perform bio filtration the beads must be colonized with a large enough colony to handle the load of dissolved ammonia presented to it. This may take up to 4-6 weeks at temperatures above 60-65 degrees F. Until the colony has grown large enough, the pond owner **MUST** be responsible for monitoring the levels of ammonia and nitrites in the pond water and taking appropriate measures to correct dangerously high levels.

## HOW DO YOU SIZE A BEAD FILTER?

When we start talking about bead filter size, usually the first thing said is "I have a \_\_\_ gallon pond. What size filter do I need?" This just gets the conversation rolling. The next question should be, "How many fish do you plan to keep in the pond?". Fish have to eat and what it really boils down to is how many pounds of food is the pond keeper going to feed per day. The larger the fish load and the more food that will be fed, the larger the filter needs to be. A good rule of thumb when dealing with bead filters is this: 1cu. ft. of beads will handle the solids capture and nitrification of up to one lb. of food per day. 100lbs of fish fed at 1% body weight or 50lbs of fish fed at 2% body weight. This is feeding 35% protein food. Water quality and clarity can be achieved by adjusting feeding rates and/or stocking densities. See the below table of technical data for your selection:

MODEL	DIAMETER X HEIGHT	WATER FLOW RATE(lpm)	POND CAP.	MAX FISH LOAD	FOOD PER DAY	MEDIA (BEADS)
UF-MS18	450X670mm	150	7.5m <sup>3</sup>	25kg	max.250gr	55ltr
UF-MS21	525X675mm	192	9.50m <sup>3</sup>	35kg	max.350gr	70ltr
UF-MS25	625X745mm	270	30.00m <sup>3</sup>	78kg	max.780gr	120ltr
UF-MS28B	710X830mm	320	34.00m <sup>3</sup>	94kg	max.940gr	160ltr
UF-MS32	800X905mm	420	52.00m <sup>3</sup>	124kg	max.1240gr	230ltr
UF-MS36	900X1005mm	500	73.00m <sup>3</sup>	172kg	max.1720gr	320ltr
UF-MS40	1000X1085mm	550	101.00m <sup>3</sup>	214kg	max.2140gr	430ltr
UF-MS44	1120X1195mm	630	142.00m <sup>3</sup>	300kg	max.3000gr	590ltr
UF-MS48	1200X1325mm	700	148.00m <sup>3</sup>	310kg	max.3100gr	750ltr

## SETTING UP YOUR BEAD VORTEX FILTER

1. Remove the filter from the box and locate the plastic bag containing the lid to the filter.
2. Inspect the tank, valve, and all components for any shipping damage.
3. Position the filter at the site of installation. Be sure that this is a level site with full access to all sides of the filter, as you will need to use the sludge drain on a regular basis and may eventually need to use the tank drain valve. We also recommend that the filter be installed on a pad of some sort to prevent settling.
4. Attach the multiport valve. Be sure that the "O" rings of the valve are properly positioned. **\*\* Caution \*\*** Handly tighten the unions, do not use a wrench, as you may crack the outer ring by over tightening.
5. Make pipe connections on the 1.5" or 2" . **\*\* Important\*\*** Install a swing check valve on the suction line from the pond to the pump. Install this below water level and you will have much less trouble priming your pump. Also be sure that the waste water is directed away from the filter site, so that there is not settling of the filter system from moist ground around the filter.
6. Set the multi-port valve to the FILTER position; make sure the SLUDGE DRAIN and DRAIN PLUG are closed. Open the AIR RELIEF on the top of the filter. Turn on the pump and when water sprays out the air relief valve, close it. Your filter is now operational.
7. Insert the blower with section of PVC pipe that came with the filter into the upper of check valve for the blower attachment (Do not glue). Don't pick up the blower and the silencer side (top cap) as it is not glued to the blower. Open check valve first, then turn on the blower to allow pressurized air to enter the filter tank for bead agitation.

## BEAD VORTEX FILTER OPERATING INSTRUCTIONS

Now that your filter is installed and running there are a few simple things that you need to know and understand.

### FILTER FILTRATION

This has been stated earlier, but is very important. It takes 4-6 weeks of operation at temperatures above 60-65 degrees F. before there is a large enough colony of bacteria to handle the bioconversion of ammonia and fine particulate straining. During this transition period the pond owner must watch the ammonia and nitrite levels in the pond. If they become dangerously high, steps should be taken to correct the problem, such as a water change.

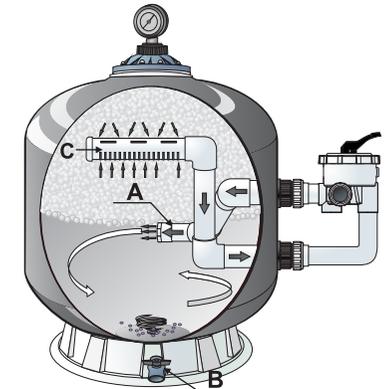
as a water change. Also during this period fine particulate straining will not be fully completed and you may notice your water being less polished than you would like. Expect of the above issues will be improved with time and the growth of the bacterial colony. This will occur with any type of bead filter used.

## ULTRAVIOLET LIGHT STERILIZERS

Bead filters will remove suspended particles down to 5-10 microns in size. However, some algae particles are smaller than 5 microns and will not be removed by the beads. These tiny algae cells will give the water a green cast and affect the clarity of the water. If the pond owner wants crystal clear swimming pool clarity, then a UV-light is needed. UV-lights will also remove many harmful bacteria and decrease the suspended bacterial counts in the water. We recommend the use of UV-lights for the above reasons.

## BEAD FILTER OPERATION

Water enters into the tank (A) under pressure from the pump. This water, by means of the unique design of the MINDER Bead Vortex Filter, spins separating the heavier solids and forcing them to the centre of the tank. The solids are collecting in the centre of the filter, waiting to be hydraulically purged out under pressure from the pump. All you



have to do is open the swirl separation valve (B) with the pump running and the filter in it's normal filtration mode and the heavier solids are evacuated in just a couple of seconds. What does all of this mean? The most unique, efficient filter of its kind. An efficient filter does not hold solids, it gets rid of them!

Now that the water is in the tank it is forced slowly upward in the vessel through zillions of beads about the size of BBs. On these beads are billions of nitrifying bacteria and these hungry bacteria are consuming vast amounts of ammonia, nitrites, etc. and performing what is known as nitrification. This is how we actually have clean, healthy water .

Water continues to flow upward through the beads and exits out of the vessel via the top spray bar (C). This water then continues into the multi port valve and