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## **INTRODUCTION**

ClariSea Fleece Filters utilise automatic fleece advance system to achieve unparalleled water clarity, at high flow rates, with a compact footprint.

This product has been developed over several months and has gone through many different prototyping stages to reach the point of release as the Gen2 ClariSea Fleece Filter.

## **PRINCIPLE**

The automated take up spool has an integrated motor which is operated by a float switch inside the filter body to advance new fleece into the filter when the current fleece becomes clogged with detritus.

The fleece is guided through a “U” shaped path retained by outer sieve plates and fed by a specially designed inlet tube which distributes the incoming water stream uniformly and reduce turbulence, especially with high flow rates.

A bypass aperture is provided and offers the ability for the user to adjust the amount of water that can bypass the fleece – the later is especially useful when feeding the aquarium.

The design of the unit prevents splashing during operation, giving very quiet operation.

## **FILTRATION EFFICIENCY**

ClariSea utilizes a specially designed plasticised fleece – the texture and structure is designed for reliable operation and filtering of particles up to 25 micron (nominally), It is also highly stretch and tear-resistant. Rolls are 25m length and will last typically up to 2

months. Usage rate depends on water conditions and also flow rate through filter - see section on flow rate and fleece usage for further information.

## **SAFETY INSTRUCTIONS**

- Use this device only for recommended purposes.
- The advance motor is operated by a safe low voltage - 12VDC via the supplied Smart Controller.
- Make sure the areas surrounding the motor advance assembly and clean roll are free from obstructions.
- Please ensure that the glass thickness of sump tank is above 5mm when hanging the unit into sump tank using the supplied "hang on" mount.
- Please ensure that your overflow system utilises a "grate or overflow comb" to prevent large items such as stones or gravel being flushed into the filter.
- Be careful if moving/stirring substrate/gravel. This can cause larger sharp edged particles and/or larger clusters of detritus/algae to be in suspension and can jam or slice the fleece.
- Keep out of reach of children.

## **OPERATION AND MAINTENANCE**

When first installing your ClariSea, we recommend that you check on the operation of the unit daily for the 1st week.

- Please pay attention to correct positioning of the used fleece on the motor assembly - if required, adjust the vertical position of the motor assembly so that the fleece is winding onto the motor assembly evenly.
- The unit should be cleaned out regularly - approximately every 2-3 months. By fully opening the bypass aperture, the ClariSea inner "basin" can be flushed out.
- Frequently check that the connectors of power supply, motor and float switch do not corrode due to the humidity inside the cabinet or possibility of salt creep. If any corrosion is found please carefully clean the connectors.
- Periodically clean the motor assembly-it is recommended to do this when changing a roll of fleece.

For first use, if the water is particularly dirty or you have an excess of algae/ detritus, please filter the water gradually as detailed below. Do not overload the filter collecting all this waste at once.

For initial operation under these circumstances, you can partially open the bypass aperture allowing a certain portion of particles to be collected by the fleece, whilst the others bypass the fleece. This prevents the filter from overload, which can cause

mechanical malfunction of the fleece advance and also abnormally high fleece consumption.

This mode of operation should be used whilst the bypass is gradually reduced to zero over several days.

## **FLOW RATE AND FACTORS DETERMINING FLEECE USEAGE**

The fleece consumption typically is around 20 - 35cm per 24 hours. This can vary greatly (depending on flow rate, production of waste, frequency and quantity of feeding in individual tanks) – see below for further information.

When initially connecting ClariSea to your aquarium for the first time, the "rate" of fleece advance will be higher than a normal operating level. This is due to the filter removing particles from the water column that have previously not been filtered. This will usually decrease after several hours and after around 12 hours operation, the water is sufficiently filtered to allow a "normal" operation.

Automatic advancing fleece filtration is a seemingly simple filtering system for removing suspended particles from the water column, but there are many things that can affect the apparent “performance” of the device.

For example:

### **A - WATER CLEANLINESS**

If we operate an SK5000 in a tank of "clean" tap water, then we will find that we can pass around 6000 litres per hour through the unit before the water level starts rise as above that point the water is flowing faster than the water can exit through the filter fleece.

If we actually ran the ClariSea SK5000 like this, what we would find is that what you think is clean water actually does have particles in it and the ClariSea will start filtering them out straight away. This would result in the fleece advancing as these minute particles are caught, causing the water level inside the filter to rise and operate the float switch. However, after a very short time all particles will be removed from the water and then filter will operate with its water level at just below the float switch. The filter will comfortably continue to operate like this indefinitely without any advance of the fleece - this is because all particles have been removed from the water. In this situation, we can comfortably state the max flow rate of this filter is 6000 litres per hour.

However, when connecting the filter to an aquarium, things change.

As above, particles will very quickly be initially filtered out of the water column, however particles are constantly being created in the aquarium and the rate of this creation of particles varies from aquarium to aquarium - it can even depend on the species of fish that are kept as some fish produce more waste than others and also

some fish are more prone to disturbing the substrate, which again will cause particles to be suspended in the water column. Clearly, this can make a substantial difference to the rate of usage of filter fleece - the more particles, the quicker the fleece advances.

The dirtier the water the shorter the time the fleece will last!

## B - FLOW RATE

In addition, the flow rate through the filter will also make a difference - the higher the flow rate through the ClariSea fleece filter, the more "sensitive" the filter is to the filter fleece becoming blocked by particles. Higher flow rates will cause greater amounts of fleece advance - i.e. the float switch is triggered more frequently with more flow as the water level in the ClariSea filter rises more quickly.

## C - HEIGHT ABOVE WATER

Finally, the height that the unit sits above the water will also affect fleece life.

If the ClariSea unit is positioned so that only the bottom of the unit is in the water then there is a tall head of water pressure within the unit to force water through the filter and the fleece will last longer.

Conversely, if the unit is almost fully submerged then there will be a low head pressure to force water through the fleece and the water level will rise easier, triggering the float and moving on the fleece.

We would generally not suggest immersing the unit by more than 200mm and generally the higher the better.

## CONCLUSION

So, from the above it is clear that there are numerous factors that affect the apparent "performance" of the ClariSea filter. All of these factors will have an effect on the rate of usage of the fleece! This makes it very difficult to state a flow rate for the ClariSea Filter.

If you find that you are experiencing a higher fleece consumption than you would like, then you may want to adjust the bypass of the ClariSea filter to decrease the flow rate that actually passes through the filter. Please make small adjustments each time and monitor to achieve the fleece consumption that you are happy with.

## SIMPLE FLEECE REPLACEMENT

When the clean roll is empty, the smart controller will generate an alarm.

At this time the end of the fleece usually stops advancing at a position level with the float switch on the clean side of the Clarisea unit, with the water overflowing the end of the roll and between the filter plate and the splash guard.

To replace the roll

1. Cut the dirty fleece along its width at the top of the dirty roll holder. This allows removal of the motor assembly with the remainder of the dirty fleece. Remove the motor assembly. **DO NOT REMOVE THE CUT PIECE OF USED FLEECE FROM THE CLARISEA AT THIS TIME.**
2. Put the new clean roll onto the clean roll holder being sure fleece unwinds clockwise.
3. Fully open the bypass flap to reduce water pressure in the Clarisea unit.
4. Grab and pull through the short end of the dirty fleece, (end closest to clean roll, NOT end closest to motor assembly), back toward the clean roll slightly to allow easy access to the end of the dirty fleece.
5. Overlay the end of the new fleece over the end of the dirty fleece by about 2cm and staple together in 3-4 places to attach the 2 rolls together (this is only temporary).
6. Carefully pull on the cut end of the used fleece closest to the motor assembly – this will now draw the new fleece through the Clarisea unit.
7. Keep drawing the new fleece through in this way until it is easy to grab hold of the new fleece at the side closest to the motor assembly.
8. Cut the old fleece off just below the level of the staples.
9. Re attach the motor – the fleece can now be threaded onto the motor assembly – cut a square approx. 20mm x 20mm out of the rear corner of the fleece and place the free end of the fleece from left clockwise around the motor assembly – clip the grey corrugated sleeve over the end of the fleece – this will retain the fleece.
10. Close the bypass flap.
11. Manually advance the motor assembly by pressing the manual advance button until 2 – 3 turns of fleece are wound onto the motor assembly whilst checking for smooth operation and correct alignment of fleece - be sure to check the alignment of the motor assembly so that fleece rolls onto the assembly evenly.

## USED FLEECE REMOVAL

1. Cut the roll of dirty fleece along its width to allow removal of the motor assembly with the roll of dirty fleece.
2. Loosen the screw at the rear of the motor assembly and carefully slide the motor assembly and dirty fleece together upwards in the slot in the rear panel to remove.
3. With the motor assembly removed, whilst holding the used fleece in one hand, and the motor assembly mounting screw in the other, pull the motor assembly and fleece apart - the used fleece should slide off the front of the motor assembly with the corrugated sleeve still inside.
4. Squeeze the corrugated grey sleeve and remove from the used roll then discard the used fleece.
5. Replace the corrugated sleeve back onto the motor assembly and re attach the motor assembly to the Clarisea unit.

## TROUBLESHOOTING GUIDE

### 1 - POSSIBLE ROLL JAM/MOTOR FAILURE (FLOAT HELD IN UP POSITION FOR MORE THAN 5 SECONDS)

- Red alarm LED will flash.
- Audible alarm will sound for 2 seconds every 5 seconds.
- **Automatic advance of fleece disabled.**

Likely causes:

**A - Fleece roll jammed** – to check if roll jammed – use the manual motor advance button to see if roll can be advanced. If roll cannot be advanced - check there is no restriction on clean roll - try to pull the fleece through manually by hand a small way and then try to wind onto the dirty roll using the motor advance button.

- Note that the clean roll is designed to rotate on the 2 sponge spacers. If the ends of the cardboard centre tube are damaged, squashed or swollen with water then this may create friction and a resistance to rotation and may be the first place to look.
- Try manually pulling through some of the fleece to ensure that the fleece is not trapped on the bottom rollers due to a large lump of gravel having been drawn through.

**B - Float switch stuck** in the up position – visually check if float switch float is the same level as water in Clarisea unit or above water level – if above the water level in Clarisea, gently try to move the float switch up and down several times by hand.

**C - Motor assembly fault** – as above in A. If after pulling some fleece through towards the dirty roll, the motor assembly still cannot wind, the motor assembly will need to be removed to be inspected.

- Using a sharp knife or scissors, cut the dirty fleece along its width as it meets the dirty roll (leave the remaining fleece in the Clarisea to allow it to be re attached to motor assembly).
- After removing the motor assembly, remove the dirty fleece by holding the rear motor mounting screw in one hand and grabbing hold of the fleece and slide the fleece away from the rear of the motor – the used fleece should slip off with the plastic corrugated sleeve still inside the fleece roll – remove this corrugated sleeve and re install on the motor and discard the used fleece.
- Check operation of the motor with the manual advance button – can the motor be heard turning? – if not, the motor may be damaged and require replacement.
- If the motor can be heard turning, remove the motor outer sleeve by removing the front screw in the centre of the motor assembly and remove the motor outer sleeve. Check operation of the motor with the manual advance button – is the “+” shaped drive shaft turning? If not, can you see if the motor shaft is turning (the “+” shaped driveshaft is slipping on motor shaft)?

## **2 - POSSIBLE FLEECE EMPTY (FLOAT NOT TRIGGERED WITHIN THE 8 HOUR TIME LIMIT)**

- Blue/Red LED both flashing, audible alarm will sound for 1 second every 2 seconds.

- **Automatic advance of fleece disabled.**

Likely causes:

A - Is the clean roll of fleece empty - the water in the Clarisea is spilling over the top of the clean end of the fleece? If so, replace the fleece roll.

B - Is the bypass flap opened, allowing too much water to escape?

C - Is the unit assembled correctly (particularly on new installations) with the fleece threaded correctly without water bypassing the sides of the fleece?

### **3 - POSSIBLE INITIAL INSTALLATION ERROR (FLOAT NOT TRIGGERED WITHIN 48 HOURS)**

- Red LED will flash at 10 second intervals (audible alarm will sound with each flash).
- **Automatic advance of fleece disabled.**

Likely causes:

A - Is the bypass flap opened, allowing water to escape too much?

B - Is the unit assembled correctly (particularly on new installations) with the fleece threaded correctly?

C - Insufficient flow through the Clarisea unit – increase flow through Clarisea.

### **4 - DIRTY ROLL DOES NOT RUN SQUARE ON THE DIRTY ROLL HOLDER**

Likely causes:

A - The dirty roll holder has not been installed level causing the fleece to run over and build up on one side.

The back plate of the Clarisea body has a guide line marked where the dirty roll is designed to fit. This line should go straight through the centre of the head of the securing bolt.

- Is the roll is moving towards the **BACK** of the dirty roller? This means that the back of the roll is set too **LOW** relative to the front guide plate. Unscrew and **RAISE** the motor position slightly on the back plate.

- Is the roll is moving towards the FRONT of the dirty roller? This means that the back of the roll is set too HIGH relative to the front guide plate. Unscrew and LOWER the motor position slightly on the back plate.

*TIP: The motor can be inserted into slot on the back plate with the alignment peg upwards or downwards. Sometimes reversing this position will help to level the dirty roller.*