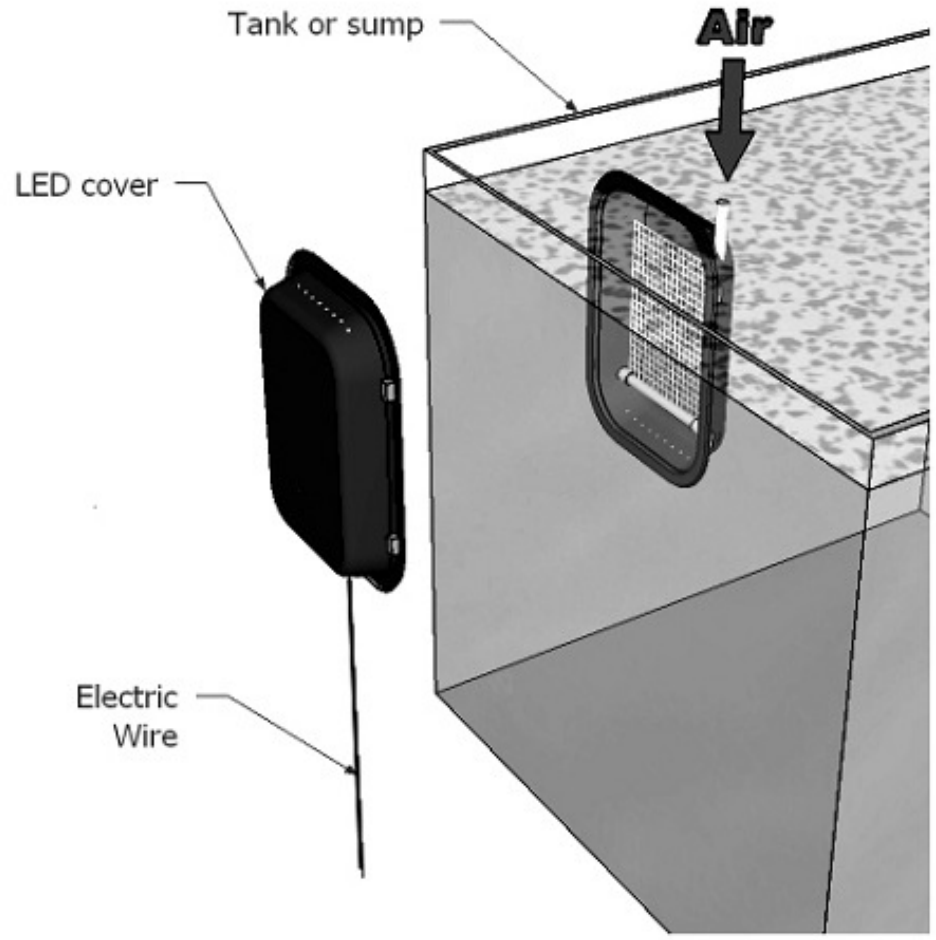
Santa Monica Filtration®

HOG.5
HOG1
HOG1x
HOG1.3
HOG2
HOG2x
HOG3
HOG3x
HOG3xx

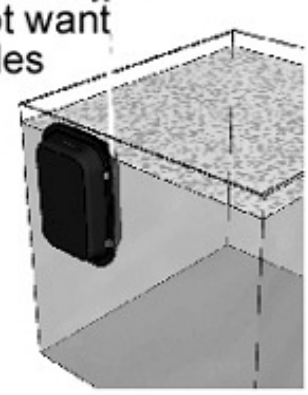
Hang On Glass® Upflow Algae Scrubber®

If your HOG is not growing some color (brown, yellow, green, black) within 2 weeks, email us or ask at: www.AlgaeScrubber.net or www.Santa-Monica.cc

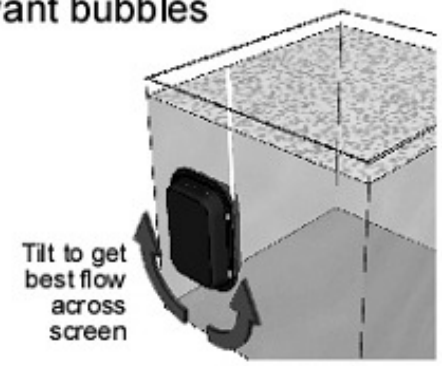
HOG™ UAS™ Installation



Position if you do not want bubbles



Position if you want bubbles



Updated June 2023

HOG.5 for glass or acrylic up to 1/4" (6mm) thick
HOG1, HOG1x for glass or acrylic 1/4" to 1/2" (6 to 12mm)
HOG1.3, HOG2, HOG2x, HOG3 for 1/4" to 5/8" (6 to 16mm)
HOG3x, HOG3xx for 1/4" to 1/2" (6 to 12mm)

NOTE 1: Algae must be removed from the scrubber in order for nutrients to be removed from your water. Do not go longer than 10 days before cleaning/harvesting.

NOTE 2: The magnets on the larger HOG models are very strong for their size and should be kept separated. If they stick together, do not try to pull them apart or you will bend the covers. Instead, twist the covers in different directions, like opening a jar.

NOTE 3: The HOG scrubber needs a light-reducer cloth placed over the LEDs for the first week to reduce the high-intensity light which reflects on the pure white surfaces. So be sure to use the cloth which is included, to cover about half of the lights. After growth starts and the surfaces are no longer white, the cloth can be removed. The HOG3x and HOG3xx also have a low-power mode to help with this.

NOTE 4: Do not drop the power supply box on the floor, or put in humid or wet area like a sump.

Thank you for your purchase of this Santa Monica Filtration® Hang-On-Glass® upflow algae scrubber®, patents number 9,115,008 and 9,708,207 and 9,408,374 and Chinese CN203392929U. This device will do most of the filtering needed for your fresh or saltwater aquarium, and in most cases it will do all the filtering if it is the proper size for your amount of feeding that you do, and the amount of rock that you have. Part of this filtering includes helping eliminate two very important things that drive most aquarium owners crazy: Algae and waterchanges. The filter works by growing algae inside the filter, and these algae consume all the "bad" things out of the water*. This is how all the oceans, and all the lakes, are naturally filtered.

Aquarium size: The **HOG.5** has 12 square inches of 1-sided growth surface and is designed to be the only filter on an aquarium that is fed up to 1/2 frozen cube per day, or 5 pinches of flake food per day, or 5 square inches (30 sq cm) of nori seaweed per day, or 0.05 dry ounce (1.4 grams) of pellet food per day. Each 50 pounds (23 kg) of phosphate-soaked problem rock counts for an additional 1 cube a day.

The **HOG1** and **HOG1x** have 24 square inches of 1-sided growth surface and are designed to be the only filter on an aquarium that is fed up to 1 frozen cube per day, or 10

pinches of flake food per day, or 10 square inches (60 sq cm) of nori seaweed per day, or 0.1 dry ounce (2.8 grams) of pellet food per day. Each 50 pounds (23 kg) of phosphate-soaked problem rock counts for an additional 1 cube a day. The **HOG1x** is suitable for saltwater with phosphate as high as 0.5 ppm, and freshwater much higher.

The **HOG1.3** has 30 square inches of 1-sided growth surface and is designed to be the only filter on an aquarium that is fed up to 1.3 frozen cubes per day, or 13 pinches of flake food per day, or 13 square inches (78 sq cm) of nori seaweed per day, or 0.13 dry ounce (3.6 grams) of pellet food per day. Each 50 pounds (23 kg) of phosphate-soaked problem rock counts for an additional 1 cube a day. The **HOG1.3** is great for freshwater.

The **HOG2** has 48 square inches of 1-sided growth surface and is designed to be the only filter on an aquarium that is fed up to 2 frozen cubes per day, or 20 pinches of flake food per day, or 20 square inches (120 sq cm) of nori seaweed per day, or 0.2 dry ounce (5.6 grams) of pellet food per day. Each 50 pounds (23 kg) of phosphate-soaked problem rock counts for an additional 1 cube a day. The **HOG2** is great for freshwater.

The **HOG2x** has 48 square inches of 1-sided growth surface like the HOG2 (but has stronger lights) and is designed to be the only filter on an aquarium that is fed up to 2 frozen cubes per day, or 20 pinches of flake food per day, or 20 square inches (120 sq cm) of nori seaweed per day, or 0.2 dry ounce (5.6 grams) of pellet food per day. Each 50 pounds (23 kg) of phosphate-soaked problem rock counts for an additional 1 cube a day. The **HOG2x** is great for freshwater with high nitrate.

The **HOG3** has 36 square inches of 2-sided growth surface and is designed to be the only filter on an aquarium that is fed up to 3.0 frozen cubes per day, or 30 pinches of flake food per day, or 30 square inches (180 sq cm) of nori seaweed per day, or 0.3 dry ounce (8.4 grams) of pellet food per day. Each 50 pounds (23 kg) of phosphate-soaked problem rock counts for an additional 1 cube a day. The **HOG3** is suitable for water with phosphate as high as 0.2 ppm. Since it has strings, the **HOG3** is best for saltwater.

The **HOG3x** has 36 square inches of 2-sided growth surface and is designed to be the only filter on an aquarium that is fed up to 3.0 frozen cubes per day, or 30 pinches of flake food per day, or 30 square inches (180 sq cm) of nori seaweed per day, or 0.3 dry ounce (8.4 grams) of pellet food per day. Each 50 pounds (23 kg) of phosphate-soaked problem rock counts for an additional 1 cube a day. The **HOG3x** is suitable for water with phosphate as high as 0.5 ppm. Since it has strings, the **HOG3x** is best for saltwater.

The **HOG3xx** has 36 square inches of 2-sided growth surface and is designed to be the only filter on an aquarium that is fed up to 3.0 frozen cubes per day, or 30 pinches of flake food per day, or 30 square inches (180 sq cm) of nori seaweed per day, or 0.3 dry ounce (8.4 grams) of pellet food per day. Each 50 pounds (23 kg) of phosphate-soaked problem rock counts for an additional 1 cube a day. The **HOG3xx** is suitable for water with phosphate as high as 1.0 ppm. Since it has strings, the **HOG3xx** is best for saltwater.

The amount of water in the aquarium, or the dimensions of the aquarium, are not important. If you feed more than the above amounts, you can use additional HOG filters to add up to the amount that you are feeding, and then clean one of them at a time on a rotating schedule (one per week, etc). If you feed much less than these amounts, and the aquarium is very small, then it will still work but you just need to find a place where the filter will fit (it's not possible to over-scrub). Note that if you have rocks which are soaked with phosphate from having been in a problem aquarium, **each 50 pounds (23 kg) of problem rock will add 1 cube a day to your feeding amounts**; so be sure to account for this when choosing a scrubber size. For example if you feed 1 cube a day, but have 100 pounds of rock that came from a tank with nuisance algae problems, this rock will add 2 cubes a day to your feeding, meaning that you would need a scrubber for 3 cubes a day. This applies even if the rock was dried out and bleached, because this does not remove nutrients from the rock.

Filter Position: This HOG scrubber filter can be placed below or slightly above the water surface of the aquarium or sump. If you don't want any bubbles, put the filter slightly above the water surface so that the top 1" (2.5 cm) of the filter is out of the water. If you want bubbles, put the filter farther down under the water surface. The filter could also be placed in the back-section of an all-in-one aquarium if the space is at least 5" (12.5 cm) wide for the **HOG.5**, **HOG1** or **HOG.1x**, or 7" (17.5 cm) wide for the **HOG1.3**, **HOG2**, **HOG2x, HOG3**, **HOG3x** or **HOG3xx.** The **HOG.5** is the only one without magnets on the side, so it can be trimmed about ½" to fit in back-sections as narrow at 4 ¼" (10.7 cm).

Make sure that the holes on the bottom of the inside wet case are not blocked by sand or gravel. If you don't want bubbles, but can't raise the filter above the water line because a rim gets in the way, then you can attach an air-outlet hose or fitting to the top of the filter, so the filter can go lower but the air can still exit above the water line. If you do this, turn the air-outlet hose sideways above the water line so that when water comes out of the hose it will not spray upwards.

If you want your HOG scrubber to attach to thicker walls than it was designed for, or if for some reason you want the filter to really stay in one place and not slide easily (especially the **HOG3x** and **HOG3xx** which have the most weight), you can rub a thin layer of silicone caulking into the rough rim texture on the LED OUTSIDE DRY case (where the case touches the outside of the glass) and let it dry overnight without it touching the glass; when dry it will stay in one place on the glass and will not slide around easily at all. DO NOT put the silicone on the inside (air bubble wet side) case, because this will actually make the filter more slippery on the glass. And DO NOT silicone the outside shell to the glass; instead let the silicone dry on the shell first, then put it on the glass. This way you can still remove it or slide it as needed.

Light Timer: The red lights (LEDs) in the filter should be put on a timer so that they stay on for part of the day, and off for the rest of the day. The LED light usually should not stay on for 24 hours or the filter may not function well in saltwater because it might get too much light and thus might not grow the algae it needs to grow in the filter;

however if your tank is freshwater, you can try 24 hours of light (no timer) because sometimes it does work. Otherwise, a good starting point for a timer is 18 hours per day for your first week. Make sure to WATCH the light turn off when it is supposed to, especially if using a controller; there have been several cases of controllers NOT turning the light off when it was programmed to do so. If you do not have a timer, you can start without one until you get one. If you do try 24 hours (no timer), plan on trying a timer later, to see if it helps the growth.

Once most of the white growth surface is no longer white, increase the hours of light by 2 per day the next week. If the growth surface continues to expand, increase the hours by another 2 more per day for the week after that. However if the growth surface starts showing a bald spot or starts losing growth, decrease the hours by 2 per day. By adjusting the hours per day you can control the growth: A bald or white "growth ring" in the middle means you need less hours; thick growth (or black growth) in the middle means you should add more hours, up to 24 hours per day, especially in freshwater. Eventually you will find the overall best number of hours for your aquarium and amount of feeding you do. The **HOG3x** and **HOG3xx** can have both power supplies connected to the same timer, however you should start the first week with only the low-power mode (just one plug) connected that has the fewest red lights.

Air Pump: The **HOG.5** requires an air pump that can provide up to 1 liter per minute (.04 cfm) of air to make air bubbles flow up the growth surface; almost any small low-cost pump will be enough. The **HOG1** and **HOG1x** need at least this much air and preferably more. Most medium-cost aquarium air pumps can usually handle more than 1 lpm; pumps that say they can run 2 airstones, or pumps with 2 air outlets (you connect them into one with a "T" fitting), will usually be more than enough for the **HOG1** or **HOG1x**. The **HOG1.3**, **HOG2**, **HOG2x, HOG3**, **HOG3x** and **HOG3xx** require up to 3 lpm (0.12 cfm), and will usually need a larger 2-outlet air pump with both outputs connected together with a "T" fitting. For multiple larger HOG's, a bigger pump such as a Hailea ACO-9720 is best because it will power all of the HOG's by itself, and is very quiet; it uses lots of metal and rubber to absorb the sound (and thus may have a "new tires" rubber smell for a few weeks when it is new). In the U.S it is available from Pentair Aquatic Eco Systems: https://pentairaes.com/outdoor-air-pumps.html (the smaller 25 watt version)

It is the air bubbles which move up the white growth surface, and also supply carbon dioxide (CO2 in the air, after the CO2 in the water is used up) to the surface, which allow algae to grow in the filter. The air pump should run 24 hours a day; however you can turn it off for a few hours when you turn the red LED lights off, if needed; just make sure the red LEDs are off too. If you place the filter slightly above the water surface (to prevent bubbles from getting out of the filter, and to make it more quiet) but are getting water spraying out of the hole at the top of the HOG, reduce the amount of air bubbles using the control knob on the pump, or by pinching the air hose with a paper clip, or tying the hose in a knot, or just moving the HOG up higher on the glass. Make sure to place the air pump above the aquarium, so water does not drain out if the power goes off. And if you

don't have a large enough pump for the HOG scrubber, just use what you have until you get a bigger one.

Sound: You can change how much sound the HOG scrubber makes by reducing the airflow (by pinching the tubing from the air pump) and by changing the position (up or down) of the filter on the aquarium glass. The bubble tubing inside the filter can also be adjusted by moving the cut-segments of tubing; the more closed the segments are, the less sound they will make; the more open they are, the more sound they will make, and the more air is required. Filtering, however, will be better with more and larger bubbles because it will grow more algae in the filter. If you want to make the HOG even more quiet, you can attach a tubing to the top hole air outlet, and route the tubing to a mini-muffler that you can make from a plastic jar filled with cotton above the water surface.

Bubble Adjustment: The bubbles come out of the tubing below the growth surface. The tubing is cut lengthwise, and with crosscuts, to form little flexible segments; the bubbles come out from between these flexible segments (the segments are purposely more on one side than the other). When setting the filter up for the first time, look at the bubble flow and adjust the little segments by pushing them down or by slighting raising them up, or by tucking them down under other segments to get good bubble flow across the growth surface. Also you can tilt the whole filter one way or the other (twist it left or right) to help direct the bubbles to the left or right; the filter does not need to be straight up-and-down. Perfect bubble flow is not needed, however, because once thick algae growth occurs, the algae will re-route the bubbles anyway. The Green Grabber® growth surface of the **HOG1**, **HOG1x**, **HOG2**, **HOG2x, HOG3**, **HOG3x** and **HOG3xx** goes all the way from the left edge to the right edge, so the bubbles you see may not appear to reach all parts of it; however small bubbles which you cannot see do reach these areas as the water circulates around inside the filter. More bubbles, however, which requires more air, is always better.

Filter Cleaning/Harvesting: The filter can be cleaned when the algae growth gets thick, which is usually every 7 to 10 days. If the growth is not thick by 10 days, clean anyway. Newer filters usually have to run more days than older filters do before thick algae grows, depending on your nutrient levels and how you adjust the shade cloth if used. Just check the white growth surfaces every few days to make sure the bubbles are still flowing properly. Also, if you are using the filter on a brand new tank that you have not started feeding yet, there will be very little growth at all until you start feeding. The **HOG3x** and **HOG3xx** should be left in low-power mode (one plug, with the fewest red lights) on these tanks until feeding starts.

To clean/harvest, remove the outside dry portion of the filter (with the red LEDs); the inside portion (in the water) can then be pulled up. When pulling up this inside portion, you can hold the bottom of it against the glass so as to "scrape" the algae off of the glass on the way up, by pushing the bottom magnet against the glass as you slide it up. Now disconnect the air hose from the air pump and take the inside portion to your sink. Use a toothbrush to brush algae growth off of the growth surface, and the black case, and also the air bubbler hose (you may need to bend the little flexible segments where the bubbles

come out, to clean inside them). It may also help to blow into the air hose (or keep the air pump connected) while cleaning the flexible tubing segments so that any algae under the flexible segments will be blown out. After cleaning, the growth surface should not have any black growth remaining; any remaining growth should be green, and not brown or black. Now brush off any algae that was growing on the aquarium glass, and put the filter back into the aquarium. Look at the bubble flow to check if it is approximately even; adjust the little flexible segments if needed, and/or tilt the filter left or right to get good bubble flow again. Do not let the filter dry out; if you can't put it back into the aquarium within 15 minutes, then set the growth surface in some water in the sink or a bucket to keep it wet so the algae on it won't die. The algae can live for several days in just water, with no light or flow or bubbles. Tank water is best, but tap water can be used also.

When cleaning the black plastic case, be sure to get all growth off of the holes on the top, sides and bottom. These holes allow water to get into and out of the filter, and if they are blocked, new growth will stop and current growth will start turning yellow. So make sure you can see through the holes when you are done. The holes are small enough to keep out animals and snails, but if you would like to enlarge the holes, you can, and they will stay clean longer (they will also let out more red light).

If it is not time to clean your filter yet but your aquarium glass is growing algae and blocking the LED light, you can slide the filter sideways to a new, clean area. Once you move the filter sideways, your fish or snails will eat the algae off the glass in the old location, or you can use a towel or a scraper to clean the algae in one motion from bottom to top and out of the water. The LED light is very strong however (especially for the **HOG1x**, **HOG3x** and **HOG3xx**), and algae growth on the aquarium glass may not slow the filter down at all. And actually, it has been found that the extra algae growing on the glass sometimes helps to filter more (because there is more total growth), as long as you scrape the growth off as you slide the filter up.

If your HOG is growing very thick green hair algae (usually in saltwater), you might be able to just pull the algae straight out of the filter without taking it to the sink. If this is the case, just remove the outside LED part, pull the inside wet part up, pull out the algae, and put the inside part back. You can even swirl the algae around in the water to let the pods jump out and feed the fish before you throw the algae away. Or you can feed some of the algae to your animals directly; usually smaller amounts of feeding at a time are better. By feeding your animals from your HOG scrubber instead of from packages, your animals get very fresh live growth, and no additional nutrients are added to your water. This HOG feeding process simply takes nutrients from your aquarium water and converts (grows) them into food, so that they can be put back into your animals. It's very much like growing your own food in a garden. Generally, the more you can feed your animals from your HOG instead of from packages, the "cleaner" your aquarium will be because the nitrate, phosphate etc. that were accumulating in your water are now helping to feed your animals.

Power Supply: Do not put the power supply or the LEDs in the water, or get any water or salt spray on them. The **HOG.5** uses 2 watts of power, the **HOG1** and

HOG1.3 use 4 watts of power, the **HOG1x** and **HOG2** use 7 watts of power, the **HOG2x and HOG3** use 9 watts of power, the **HOG3x** uses 15 watts of power, and the **HOG3xx** uses 20 watts of power. It is a low voltage that is perfectly safe. The filter comes with a CE, UL, and Canadian UL approved power supply that works on both 120 or 220 volts, and this power supply converts the 120 or 240 volts down to the safe low voltage which is isolated from the aquarium. The power cord plug is for 120V (USA), so if you need to plug into a different type of outlet you can just swap this figure-8 laptop type cord with one from your country, or you can get a plug (available at any hardware, electronics, or home improvement store, or online) and cut the plug off and attach your own. The power supply does get warm, so place it where it can get air (don't put things on top of it). To allow it to run the coolest, you can mount the power supply to a vertical wall so air can flow up from under it: use double-sided tape, or just hang it with its wire. Also, it is recommended that you use a GFCI safely plug, available at any aquarium, hardware, electrical or home improvement store, or online.

Bulb Replacement: The red LEDs are replaceable by soldering if needed, and using thermal adhesive on the heat sink. They are 3 watt 660 nm deep red LEDs on a star PCB.

*** Water Changes:** If you have been doing water changes to reduce nitrate, phosphate, or nuisance algae, then an algae scrubber filter will greatly reduce the need for them and may possibly eliminate them. When algae grow in the filter, they consume nitrate, nitrite, phosphate, ammonia/ammonium, metals, CO2, and some toxins; so it's just a matter of growing enough algae inside the filter to do the filtering you need, compared to how many nutrients you are putting into the tank with the food you feed (that is why the HOG filter is sized for a certain amount of feeding per day). However, this filter (and algae in general) do not supply calcium, alkalinity, magnesium or strontium. So if you wish to reduce or eliminate water changes, you will need to supplement any calcium, alkalinity, magnesium or strontium that you were depending on water changes for. Freshwater aquariums, which may only need alkalinity (hardness) to be maintained, may get enough alkalinity from just doing evaporation top-offs with tap water from your sink.

Troubleshooting:

Lights have stopped working: If the little green light is on the power supply box, all of the red lights should be on with the same brightness. Sometimes people will drop the black power supply box on a hard floor and this will bend some of the components inside it, causing the red lights to go out. This can sometimes be fixed by tapping the power supply on a hard wood surface such as a desk, on all the sides of the power supply. Try harder each time, on different sides, until the red lights come back on. Also, sometimes moisture gets inside the power supply box from drips, sprays, or condensation. This can be solved by setting the power supply in warm sunlight for several hours, or on top of a warm surface (like your aquarium lights) for several days, or in a bowl of rice with the lid on. If none of the above works, or if only a few of the red lights are operating, or if anything is flashing, contact us for a solution.

Growth surface stays paper white: If the growth surface stays completely white after 10 days, with no spots of growth at all, and if your tank is new, then you probably just don't have enough nutrients in the water compared to how bright the LEDs are. This is the reason for the HOG's coming with black cloth to cover half the LEDs for the first week or two. This will dim the LEDs and will more closely match them to the low nutrients in the water. After growth starts, remove the cloth, and growth will continue from that point on. If your tank is not new, especially if you have algae problems, then you probably have forgotten to use the black cloth over the LEDs. Or for the **HOG3x** or **HOG3xx**, you have forgotten to start the first week with only the low-power (one plug) mode with the fewest number of red lights.

Only a light-brown growth occurs, even though your aquarium is full of algae: In this case you have an algae scrubber already in your aquarium (on the rocks), and it is competing with your HOG scrubber filter. Reduce the number of hours of light on your aquarium; this will weaken the aquarium algae on the rocks, and will give the photosynthesis (filtering) advantage to your HOG. Your HOG will need bright LEDs for this, and up to the full 22 hours per day of LED operation, but only after getting through the low-light beginning period with less red light.

Growth surface stays spotted white/black: If even after 4 weeks your growth surface is almost completely white, but has spots of black like torn black paper, and if you have very high nitrate and phosphate in the water, then what probably is happening is that very dark algae is growing (high nitrate and phosphate cause dark growth) and this growth is letting go and floating away, leaving white spots. If this is the case, there will be bits and pieces of dark algae on some parts of the scrubber, giving a white/black spotted look. Dark and black algae do not attach as well as green algae does, so it lets go. Do this: 1) Reduce the flow of bubbles (kink the airline if you need to) so the algae is not torn away, 2) Increase red light to 24 hours (no timer), and 3) Move the top of the HOG unit to above the water line so that only air comes out of the top air exit hole; this will re-circulate most of the water inside the HOG, allowing more nitrate and phosphate to be removed from the water before new water is let in, and this will also help grow green algae which will hold on better. Then clean the HOG as soon as any black grows, by using a toothbrush in your sink with running water as described above; this might be as soon as every 3 days. Green hair algae cannot attach to the white surfaces in the HOG if there is dark or black slime there.

Another possible reason for black and white round areas is that pods (in saltwater) are eating the algae faster than it can grow. Lift the growth surface out of the water; if you can see any pods (tiny shrimp) moving around, then this is probably the case. Run the growth surface under freshwater for a few minutes to remove the pods.

Only black oily algae grows: This is caused by very high nitrate and phosphate in the water. Increase lighting to 24 hours (no timer) and move the top of the HOG unit to above the water line so that only air comes out of the top hole; this will re-circulate most of the water inside the HOG, allowing more nitrate and phosphate to be removed before new water is let in. This allows the algae inside the HOG to grow in lower-nutrient water

even though the water outside the HOG is higher in nutrients. You may need more powerful HOG lights (LEDs), or other filters, to bring the nutrients down lower so that the scrubber can start growing green. Only the **HOG1x**, **HOG3**, **HOG3x** and **HOG3xx** are suitable for high-nutrient water (with phosphate over 0.2 ppm), and only the **HOG3x** and **HOG3x are** suitable for very-high-nutrient water (with phosphate as high as 1.0 ppm). Interestingly, increasing the number of hours of light in your display tank will also help, because this gives more time for photosynthesis of the periphyton on your rocks, which consumes more nutrients from the water, which brings down nutrients and lets the HOG grow greener sooner. Another trick is to not clean some of the aquarium glass; this grows algae on the glass which removes nutrients out of the water too.

Green hair algae grows in the HOG, but disappears: Your fish are eating it! Especially in freshwater tanks when the algae gets long enough to grow out of the holes at the top or the sides, the fish can get to it and pull on it, which sometimes pulls the whole strand of algae away. The solution is to clean more often, or get another HOG scrubber so that each one grows less, or put the HOG where the fish can't get to it. Also you can just stop feeding your tank, and let the animals just eat from the HOG if they are the types of animals that can do so. You would be surprised at how many fish eat algae that you never thought would, if the algae is still living.

Algae On Rocks Increases: If after running your HOG scrubber for several months you start seeing more (not less) algae growth on the rocks in your aquarium, what probably is happening is that phosphate is coming out of the rocks. As the phosphate comes out it gives algae more fuel at the surface of the rocks. This is good! This is usually the case when the phosphate in the water measures "zero", and the algae that is starting to grow on the rocks is green, long, and concentrated in certain spots; usually near the top of the aquarium and on sharp rock edges and points. Another indicator will be that there will be no algae growing on clean (no coralline) plastic or glass, even if these parts are up at the top (glass and plastic do not absorb phosphate). The rock algae will increase for a while, and when the phosphate in the rock is used up, the rock algae will start turning yellow and letting go, sometimes in large chunks which get caught in filters. The time for all this to happen can be from one to six months, depending on how much phosphate was in the rocks, how many scrubbers you have, and how many other filters you have.

The inside-HOG water level drops: The inside-portion (in the water) of the HOG should have its inside waterline up near the top of the unit. If the inside waterline drops, this means the air outlet is getting clogged and air is filling up the inside of the HOG. To fix, use a toothbrush to clean the air outlet hole at the top of the unit, inside and outside. You can increase the size of this hole if you want, but more red light will come out, and small animal might get in.

Bubbles stop, even though the air pump works: The bubble tubing is clogged. To fix, use a paper clip or other thin object to clean the inside of the air tubing. Bend the flexible tubing segments open and clean inside them, and blow air through the tube while doing this. If the HOG has been operating for many months or a year, there may be additional clogging further up the tubing, possibly behind the Green-Grabber surface; this type of

clogging is generally lime (carbonate, like in your shower), and will need vinegar put into the tubing in order to dissolve it. Keep the filter out of the water to do this, and use the included syringe (without a needle) to push vinegar into the tubing from where the air pump connects; the vinegar will flow down to the clog. It will take a few hours to dissolve, so keep the algae wet in the filter, and don't get vinegar on the algae. Try not to get any vinegar in the aquarium water either; just rinse off the whole HOG with tap water when done.

Dimensions: Each **HOG.5**, **HOG1** and **HOG1x** cover is 5" wide x 6 5/8" high x 1" thick (12.7 cm wide x 16.8 cm high x 2.5 cm thick). Each **HOG1.3**, **HOG2**, **HOG2x, HOG3**, **HOG3x** and **HOG3xx** cover is 6 5/8" wide x 8 3/4" high x 1 1/2" thick (16.6 cm wide x 21.9 cm high x 3.75 cm thick). The power cord is 10' (3 m) from the plug to the filter. The air tubing is 3' (.9m)

Warranty: This HOG scrubber comes with a 1 year warranty. Warranty is for replacement or repair only; not a refund. Costs for shipping back to us are not covered; you will need to ship the entire filter back to us before we can ship a replacement.

Warranty is limited to repair or replacement, and does not cover fish loss, personal injury, property loss, or direct, incidental or consequential damage arising from the use of it. The warranty and remedies set forth above are exclusive and in lieu of all others, whether oral or written, express or implied. We specifically disclaim any and all implied warranties, including but not limited to lost profits, downtime, goodwill, damage to or replacement of other equipment and property, and any costs of recovering animals, plants, tanks or other aquarium related items and/or equipment. We are not responsible for special, incidental, or consequential damages resulting from any breach of warranty, or replacement of equipment or property, or any costs of recovering or reproducing any equipment, animals or plants used or grown with this product.