

## ULTRA SONIC ALGAE CONTROL

### What types of algae are there ?

There are many types of algae. Algae growth appears in mainly three forms:



**Planctonic Algae** (upper left) as well as **Floating Algae** are tiny creatures floating freely. When their growth is enhanced an algae bloom occurs and the pond's water turns green.

**Filamentous Algae** (upper middle) floats like tiny threads, building swimming carpets on the pond's surface.

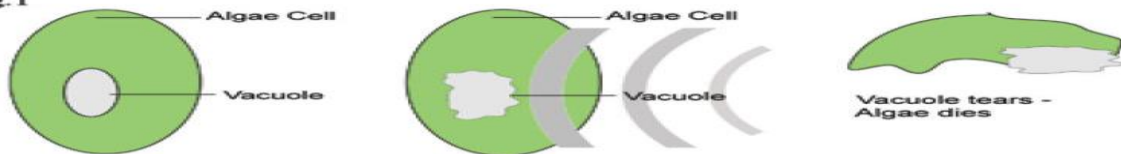
**Macrophytic Algae** (upper right) seem to be real plants, as if they have a shaft with leaves being grounded. A common species is Chara that is well known due to its musky odor.

**Algae problems ...** Excessive algae growth will choke out other water plants as their sunlight gradually gets blocked. Taste and odor problems in drinking water as well as an occasional fish kill can be directly related to excessive algae growth. Filamentous and macrophytic algae can form dense mats making swimming or fishing nearly impossible.

A complete covering will restrain the permeation of sunlight and block the necessary oxygen production for fish growth. When algae growth generates conflicts with the original purpose of the pond's use, the time has come to think about an effective method to control algae growth!

**How the Ultra Sonic Algae System works.** In most basic terms, the algae cells get shaken to bits! In little more detailed terms, the control box of the Ultrasound system has a micro chip that digitally generates a range of ultrasound frequencies. The transducer (under the water) then emits these frequencies as a series of pulses five times per second. As these pulses strike the algae cells they start to oscillate. The cells reach a point where they burst, much like an opera singer smashing a wine glass on the right note!

Fig.1



The ultrasound waves emitted are absorbed as they travel thru the water. In essence, they become weaker the further way they travel from the transducer. As a result, easy to control algae types can be controlled far out into the pond while harder to control strains, like Chara, will be controlled in close ranges but not as far away.

Planctonic algae usually dismantle within seven to ten days. Filamentous algae typically takes from four to eight weeks to dismantle entirely.

Fig.2



**Dismantling process** What happens when algae die and start to dismantle?

The fastest visible results happen with floating algae: These are no longer green when dying but turn to brown instead. Through the internal methane gas they rise to the water's surface. You may have the impression of having more algae than ever, this is not the case, it is the dead algae cells on the water's surface. (Figure 2)

It happens the same with filamentous algae, although the dismantling process will proceed much slower. The filamentous algae release from the ground and the pond's side walls and rise to the surface.

The ultrasonic device provides even more: Additionally the bio-film that adheres to the walls and to the ground (the slimy bacterial layer) is removed in a way that the nutrient medium for fungus, pathogenic germs and bacteria is gone.



**The Bottle Test** As long as the water is in motion, already dismantled algae may reside in the pond. This happens when fountains or pumps are operating. When ultrasonic devices are used, the floating algae should tear off within seven days. In stagnant water the dismantled algae cells will sink to the bottom.

Before starting the ultrasonic system take a sample of your pond's water in a clear bottle. The living algae are going to turn the water green within ten days.

Take a sample of the ultrasonic treated water and let it rest for about 48 hours. You may observe the dead algae sunk to the bottom.

Hint: Use a plastic bottle for this test instead of glass, the dead algae will adhere to the sidewalls of a glass bottle.

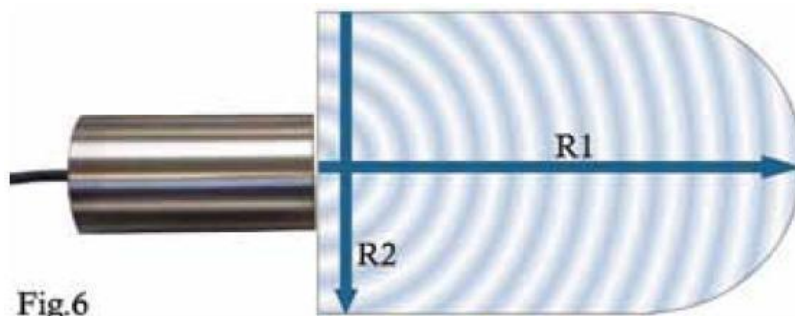
**Installation** The control unit can be installed outdoors. The housing consists of resistant ABS with an IP-67 reading. While mounting the control unit, the connector side must always point down. The unit should be placed at least 1½ feet above the ground and should be protected from splashing water. Rising water levels due to heavy rains should never reach the position of the control unit.

Prior to mounting the control unit, make sure main power supply is unplugged.

*Mounting the box with screws:* Open the box with a screwdriver. Mount the box solidly and tightly to desired location. Then position the top cover back into place. Be sure that the gasket seal is not broken or damaged! If the gasket is damaged do not mount outdoors. Be sure that there is no dirt between the gasket and cover.

**Correct positioning of the transducer** Decide the right position of the transducer by finding out which position can treat the largest surface area of

the pond/lake/ pool. Rely on a beam angle of 180° on the front surface of the transducer. (figure 6).



The size of coverage area will depend on several factors including the type of algae being controlled. Simple algae forms like floating algae will be controlled over an area up to the sizes listed above, harder forms of algae will be controlled over a smaller area due to their resistant nature. Other factors such as pond shape, presence of fountains/aerators, water clarity, weed growth, etc will also affect coverage size. In larger ponds having complex shapes more than one device may have to be used.

Fig.7 Ponds / Lakes with irregular shape

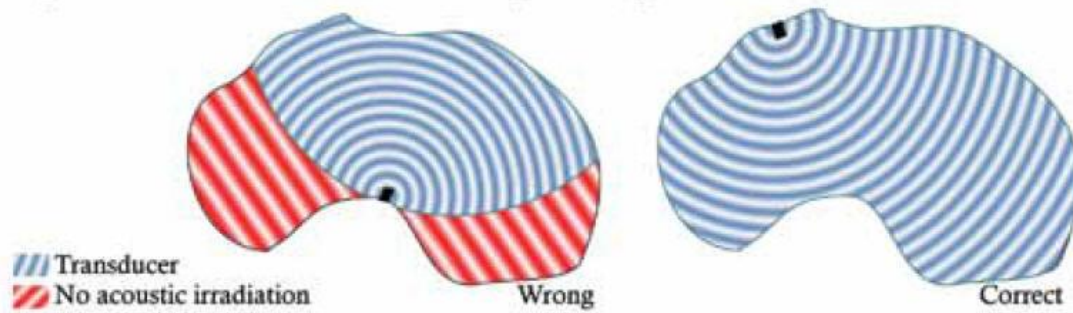


Fig.8 Ponds / Lakes with L-Form

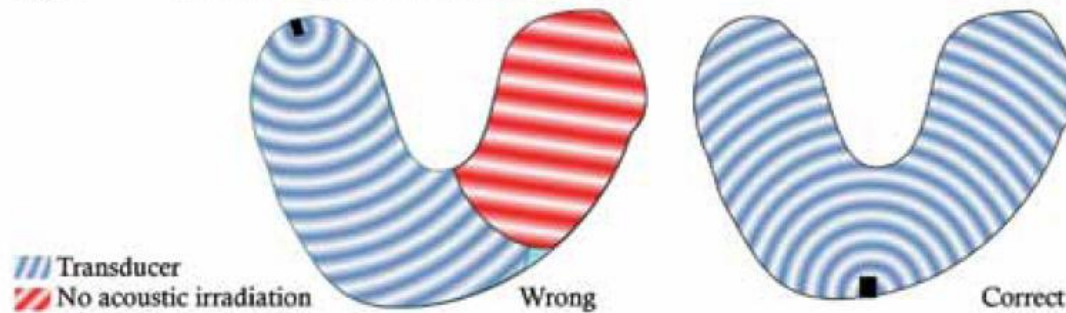
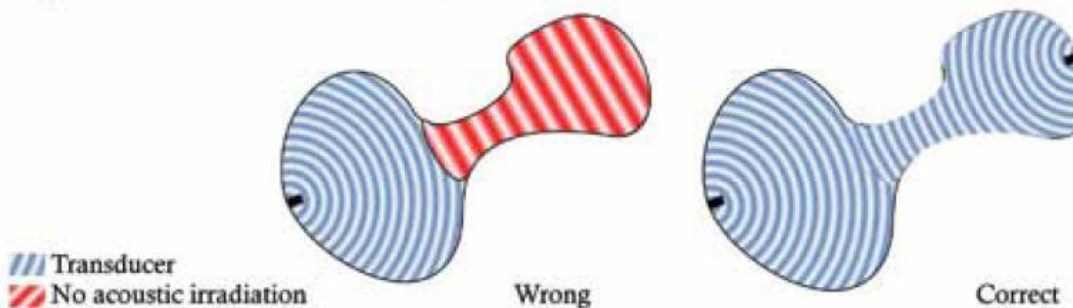


Fig.9 Two Ponds / Lakes



Do not place the transducer near a turbulent place like a waterfall, a fountain, near a pump or near the intake/outlet of a filter.

Fig.10 Pond with isle of plants

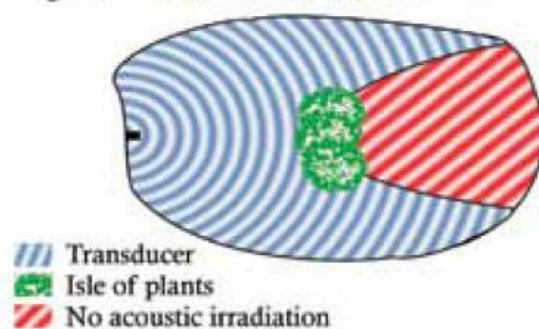
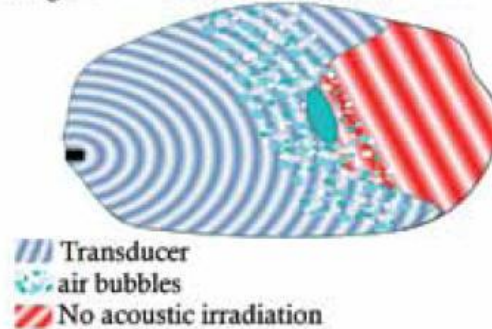


Fig.11 Pond with fountain

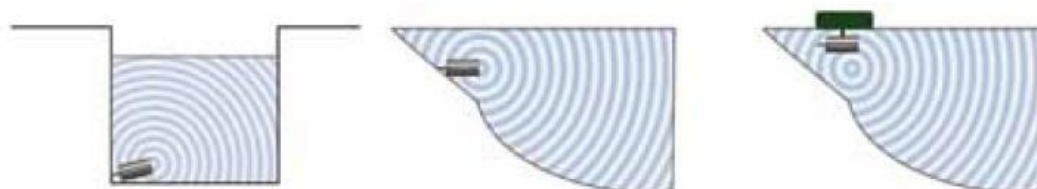


Be sure that the transducer's front side is always free of obstacles like: Plants, buds, shoots, stones, mud ... a "shadow zone" can be created when the

ultrasonic waves get hindered by an obstacle. This may result in partial or total loss of effectiveness. Underwater plants can also reduce the devices ability to reach the proper surface area.

Positioning depth depends on wall structure. When the wall is vertical without plant growth along the bank the transducer may be placed on the ground. When the bank is sloped, the transducer is placed 4" to 8" below the water's surface (figure 12).

Fig.12



### Placement of transducer

Always place the transducer horizontally. Place the transducer in a way that it remains in position after the installation. If the transducer is equipped with a float, placement may be done with a thin cord, allowing adequate tolerances due to fluctuating water levels.

Never roll up surplus power cable, lay excess cable along pond bottom in a zigzag pattern. Do not coil excess cable.

Place the supply cable at a place that is safe from mowing machines, hedge trimmers, etc. Never bury the cable without the proper protective insulation. If the supply cable has to be buried underground, follow local electrical codes when installing. Insulate the supply cable by using a conduit for this purpose. Be sure to mark the location the cable was buried and keep a drawing plan of the location with this manual.

Put the plug into the power supply socket. You will notice a gentle "clicking" sound this is the control sound for the transducer. On the control unit there are two indicator lights checking the operation.

### ALGAE TYPES CLAIMED TO BE KILLED BY ULTRASONIC WITH 100% EFFECTIVENESS:

|                         |                         |                        |
|-------------------------|-------------------------|------------------------|
| Scenedesmus quadricauda | Cryptomonas erosa       | Rhodomonas minuta      |
| Cryptomonas sp.         | Merismopedia tenuissima | Scenedesmus acuminates |
| Gloeocystis sp.         | Ankistrodesmus          | Oocystis pusilla       |

|                |                 |                 |
|----------------|-----------------|-----------------|
|                | falcatus        |                 |
| Phacus sp.     | Gomphonema sp.  | Nitzschia sp.   |
| Pinnularia sp. | Navicula minima | Ulothrix sp.    |
| Anabaena       | Aphanizomenon   | Microcystis     |
| Cladophora     | Spirogyra       | Amphanizomenon  |
| Cyclotella     | Lagerheima      | Dictyosphaerium |
| Coelastrum     | Chlorella       | Micractinium    |

#### **ALGAE TYPES THAT ULTRASONIC IS CLAIMED WITH LESS EFFECTIVENESS:**

- \* Microcystis Colonial Algae - produces a gelatinous mass and is harder to control in larger colonies, 75% ultrasonic effectiveness
- \* Pithophora - Cotton-ball Roaming Algae, produces hard cell walls and takes 6-8 weeks for control, 95% ultrasonic effectiveness
- \* Cylindrospermopsis Raciborskii - free roaming algae, light driven, 75% ultrasonic effectiveness

#### **ALGAE TYPES HARDLY DISMANTLED BY ULTRASONIC, 50% EFFECTIVENESS:**

- \* Chara - mimics the habits of vascular plants
- \* Nitella - mimics the habits of vascular plants, less rigid structure than Chara
- \* Euglena - mimics a Protozoa, free swimming and light driven
- \* Pediastrum - multi-celled algae in three stages; 8 celled, 16 celled, 32 celled
- \* Oscillatoria - free roaming algae, resembles and moves like a green worm

## **TROUBLESHOOTING**

### ***How can I check the effectiveness of the Ultra Sonic Algae System?***

Listening carefully at the transducer, you can hear clear clicking sound with irregular rhythm. On the indicator plate two LED indicator lamps are glowing. In the feed-module one LED indicator is glowing.

### ***After several weeks I can see even more algae appearing!***

Dismantling or already completely dismantled algae increase in volume because the cells have got more loose space between themselves. Furthermore, the earlier hiding algae are now drifting in between the plants and stones of the pond towards the water's surface. Skim these dead algae as much as possible and use a suitable filter pump.

### ***Although using Ultra Sonic Algae System my water remains green.***

First do the bottle test to easily see if the algae are dead. Fill a clear and clean plastic-bottle with your pond's water. You will see if the content gets green. Let the bottle rest in a calm and lucid environment for about 24-48 hours without touching. After this period a settlement at the bottom should develop. Some kinds of algae may drift or float instead. See if the water has become clear indicating that algae have dismantled. Check your filtering system and adjust if needed. If the water still remains green you should contact your local dealer.

***Can the transducer remain in the water in freezing temperatures?***

Yes, the transducer is constructed in a way that freezing or icing over does not cause any damage !

***Can I turn off the Ultra Sonic Algae System during the winter?***

No, the device should also operate in the winter. Also during the winter there is some (reduced) but steady algae growth, even under a layer of ice! If these algae are not treated, chances are high that a huge "algae bloom" will develop in the spring! At most, operation may be reduced by using a timer in the darkest and coldest period of the winter. Be sure to allow operation a minimum of about eight hours a day!

***Due to maintenance work on my pond the Ultra Sonic Algae System will be shut off for some time. Can I leave the device outdoors switched off?***

During temporary interruptions of operation you should take the device indoors in a dry and well ventilated place. This is necessary to avoid condensation inside the control unit due to humidity.

***What is the expected life time of the Ultra Sonic Algae System?***

The electronic parts don't overly wear or deteriorate and are durable under dry conditions. The transducer has a life span of about eight to ten years. Should the transducer ever have any malfunction beyond the warranty period, please contact your local dealer.

***The power supply cable of the transducer is too short. Can I extend it by myself?***

You should never do this yourself, it will void the warranty. A significant loss of performance and affectivity may occur if you don't use the original extension cables from Ultra Sonic! Furthermore the warranty voids if you take action on parts of the system by yourself.

***Does the Ultra Sonic Algae System operate with 12v or 24v direct current as well?***



You may purchase the devices for 12v or 24v operation mode. Please contact us for more information on 12v or 24v units.

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