



ULTRASONIC ANTIFOULING SYSTEM

YS-5600

YS-5602

INSTALLATION MANUAL

Distributed by:
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Photos provided by Silicon Chip Magazine.

DISCLAIMER

This product needs to be correctly installed in a confined space i.e. in the bottom or “bilge” of a boat. There may be residual fuel or other fumes in this space so extreme care and safety must be exercised at all times.

Furthermore, if you are installing the system yourself, you may be in a claustrophobic environment and not be aware that you may suffer from claustrophobia. In any event, it is wise to have an observer/assistant with you at all times when you undertake this installation.

Several skills are required to correctly install this system. These include: mechanical skills (drilling, filing, etc) and electrical skills. You will also need to be familiar with mixing and handling epoxy resins.

The success of this product is DIRECTLY proportional to the quality of the installation.

If you have any doubt about any of the above, or the installation procedures outlined in this user manual, we recommend that you use a shipwright/mechanic to undertake the installation.

Electus Distribution takes no responsibility for defective installation, nor injury or damage to persons or property.

**READ THIS MANUAL IN FULL BEFORE COMMENCING
INSTALLATION**

IMPORTANT SAFETY CONCERNS

WARNING! Performance

The Soanar Ultrasonic Antifouling System must be installed in accordance with the instructions within this manual. Failure to do so could result in reduced performance and effectiveness, personal injury and/or damage to the vessel.

WARNING! Electrical Safety

The 12VDC power supply to the Soanar Ultrasonic Antifouling System **MUST** be protected by a suitable fuse or circuit breaker on the positive wire. Refer to wiring instructions.

WARNING! Cable Connection

Prior to connection or disconnection of any cables to the main control unit or transducers, ensure that power is switched off. Failure to do so could lead to damage to the product.

WARNING!

Do not swim under the boat for any length of time while the system is operating. **TURN THE SYSTEM OFF** when swimming under or adjacent to the boat.

IF YOU HAVE ANY DOUBT ABOUT INSTALLATION OF THIS PRODUCT, SEEK PROFESSIONAL ADVICE AND ASSISTANCE!

INSTALLATION OVERVIEW

Below is a brief overview of the installation steps for the Soanar Ultrasonic Antifouling System. Following this schedule will result in the most efficient installation timeframe.

1. Planning the installation
2. Fitting the transducer mounting rings

NOTE: Preparing the hull and fitting the mounting rings first will allow more time for the epoxy to cure before carrying out the final installation of the transducer.

3. Fitting the control unit
4. Running power and transducer wiring
5. Connection to the battery
6. Fitting the transducers
7. Final connections and checks before powering up

PLANNING THE INSTALLATION

Before undertaking any actual installation, first spend some time planning your installation to avoid any wastage of time and/or unnecessary damage to the vessel.

Spending more time in the planning stage will reduce actual installation time.

Step 1 – Transducer positioning

The positioning of the transducers is critical to the effectiveness of the system. Incorrect positioning can lead to reduced or ineffective performance. Please refer to the detailing position instructions later in this manual.

Step 2 – Location of the control unit

The main control unit of the Soanar Ultrasonic Antifouling System does not typically require any maintenance during operation, other than occasional visual checks of the LED indicators. Hence, mounting the control unit in a very accessible location is not essential. It should, however, be installed above the waterline in a dry locker or bulkhead, with consideration given to the power and transducer cable runs and lengths.

Power cable length: 5m

Transducer cable lengths: 10m

Step 3 – Connection of the 12V power supply

The Soanar Ultrasonic Antifouling System requires a permanently live 12VDC power supply. Ensure that you connect to a permanent power source that does not shut off when you leave the boat with the batteries switched off.

REMEMBER – if there is no power, the Ultrasonic Antifouling System WILL NOT WORK!

TRANSDUCER POSITIONING

For best performance, please follow the recommended transducer positioning:

YS-5600 – Dual Transducer System

Sailing Yacht

Position the first transducer in the aft area. The best location is slightly aft of the stern gland of the propeller shaft, and around 200-300mm off the centreline of the boat. Position the second transducer approximately one third of the way from the bow in front of the keel, approximately 200-300mm off the centreline on the opposite side to the aft transducer. Refer figure 1.

Powerboat with conventional shaft drive

Position the first transducer in the aft, near the prop shaft gland as with the sailing yacht instructions above. Position the second transducer approximately one third of the way from the bow or just behind the bow thruster (if fitted), approximately 200-300mm off the centreline on the opposite side to the aft transducer. Refer figure 1.

Powerboat with stern drive(s)

Position the first transducer in the aft, near the transom. The best location is around 300-500mm forward, and around 200-300mm off the centreline of the boat. Ensure to keep clear of the stern drive mechanism, even if that means positioning the transducer further forward. Position the second transducer approximately one third of the way from the bow, approximately 200-300mm off the centreline on the opposite side to the aft transducer. Refer figure 1.

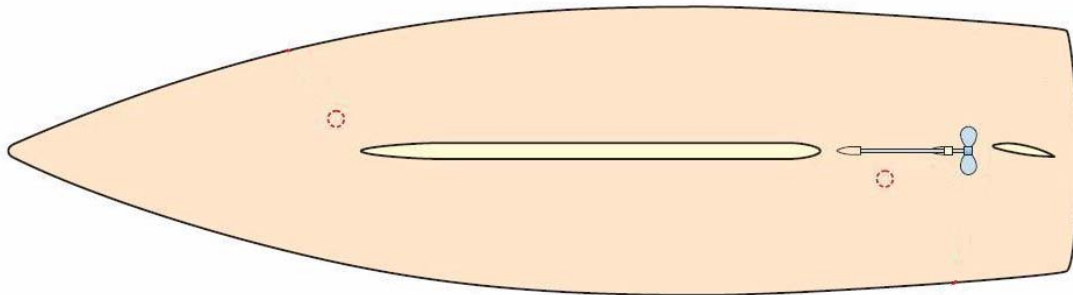


Fig 1. Position the two transducers as above

NOTE: In any of the above cases, it does not matter which side of the stern gland or centreline you install the rear transducer, so long as the front transducer is on the opposite side.

NOTE: For smaller (sub-10m) twin-engine powerboats, follow instructions for location of aft transducers for YS-5602 system.

YS-5602 – Quad Transducer System

Powerboat with conventional shaft drives

Position the first and second transducers in the aft of the boat, slightly aft of the prop shaft gland, 300-500mm off the centreline. Position the third and fourth transducers approximately one third of the way from the bow or just behind the bow thruster, approximately 300-500mm off the centreline on each side. Refer figure 2.

Powerboat with stern drives

Position the first and second transducers in the aft, near the transom. The best location is around 400-500mm forward, near each stern drive, making sure that the transducers are clear of the stern drive mechanism, even if that means positioning the transducer further forward. Position the third and fourth transducers approximately one third of the way from the bow, approximately 300-500mm off the centreline on each side. Refer figure 2.

NOTE: It is not strictly that important for the transducers to be exactly opposite each other. If you are limited by access, other structures or hull penetrating devices such as depth sounders, speed logs or water intakes, mount the transducers well clear of these. The exact location of the transducers is not particularly critical so long as they are in the general recommended area.

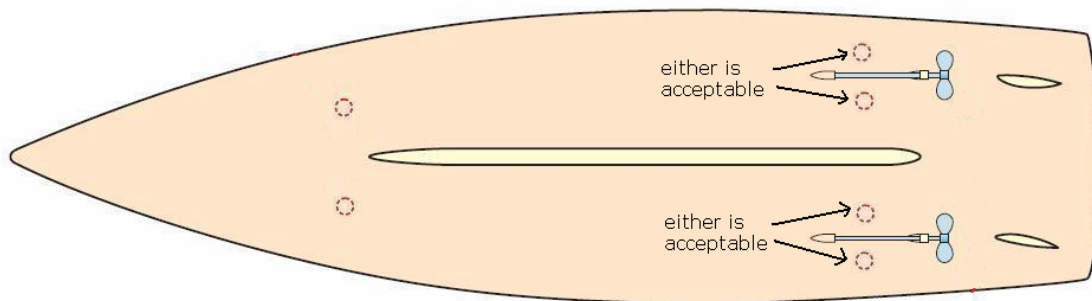


Fig 2. Position the four transducers as shown above

Transducer Positioning Notes:

Please note that the transducer position instructions in this manual are intended as a guide only. Surrounding structures bonded to the hull, such as bulkheads, stringers, supporting and strengthening structures, etc, all need to be taken into consideration. Avoid positioning transducers close to these structures as they will inhibit the effectiveness of the system. It is best to move away from the centreline and onto an area of the original solid hull. Remember, the Soanar Ultrasonic Antifouling System works by transmitting ultrasonic sound waves through the boat's hull, so positioning away from structures attached to the hull will improve the effectiveness of the system.

Do not locate transducers on any false floor or internal skin

For this system to be effective, the ultrasonic transducers MUST make direct contact with the outer skin of the hull. For boats with a sandwich construction hull, see transducer installation section for more details on installation method.

TRANSDUCER INSTALLATION

NOTE: Transducers are NOT installed through the hull. There is no need to make any penetrations through the hull itself.

Hull Preparation

To ensure best performance, careful preparation of the hull surface is vital. Whilst water will not affect the performance of the transducers once in actual use, preparation of the surfaces is critical, hence, you **MUST** ensure that all dust, water, and grease is removed before the epoxy is applied.

At each chosen transducer location, an area of the hull must be prepared for bonding. Using some 80grit or similar sandpaper, either by hand or with an orbital sander, prepare a flat and smooth surface removing any surface coatings to expose gel coat or bare metal. The surface area for the mounting ring should be adequately prepared to allow a good bond for the epoxy. The prepared area should be large enough for the mounting ring and transducer, and the mounting ring should sit completely flat on this area. Wash the area down with acetone and ensure it is dry and free of grease and dust.

ALTERNATIVE for Sandwich/Cored Hull Preparation

For those with a sandwich construction, or foam cored construction hull, you will need to follow these instructions. These instructions are NOT relevant to a normal fibreglass or metal hull boat. If in doubt, seek the advice of a shipwright experienced with sandwich/cored hulls.

In order for the transducer to be effective, the transducer must be mounted to the outer skin of the hull – hence a small area of the core material must be removed to expose the outer skin. Cut out an area approximately 150mm in diameter at the desired transducer location. This will allow room for surface preparation. The cut edge should be sealed with a gel wash or epoxy based filler to prevent water ingress. See image right, which shows a GRP hull with the foam core removed, and mounting ring fitted.



It is preferred this installation be performed with the boat out of the water.

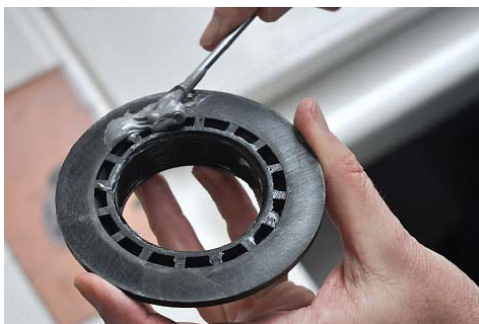
Mounting Ring Preparation



Prepare the underside surface of the mounting ring by roughing up with 80grit sandpaper. Use a sanding block to ensure surface remains flat. Clean with acetone and ensure it is dry and free from dust and grease.

Bonding Mounting Ring to Hull Surface

NOTE: Always wear rubber gloves when handling epoxy. To help avoiding epoxy setting into the thread of the mounting ring, you may consider applying a small amount of petroleum jelly to the thread of the mounting ring. See right.



Mix the included epoxy and apply a 2mm thick layer to the prepared underside of the mounting ring. See left.



Attach the mounting ring to the prepared surface of the hull, holding it down firmly until it feels secure. Then secure the mounting ring with tape to avoid it moving out of position.

When the epoxy has part cured enough to hold the ring in position, but still tacky, remove the securing tape and remove any excess epoxy from inside the ring and around the thread of the mounting ring (use a small screwdriver or scraping tools).

Allow the epoxy to cure a full 24 hours before fitting the transducer.

Fitting the transducer

Before installing, check for any loose material inside the mounting ring, and ensure the threads are clean and free of debris.

Apply a small amount of silicon (waterproof) grease to the transducer face, spreading it out to create a fine layer of around 0.5-1.0mm thickness.

Slowly screw in the transducer to the mounting ring until it stops, turning with finger tip pressure only. Allow to settle for around 30 minutes, giving a chance for any air to escape, and see if a further turn can be made allowing the transducer to make contact with the hull.



NOTE: after 1 hour it may be necessary to re-tighten the transducer (careful not to over tighten). This will get the last small pockets of air out of the silicon grease, allowing it to form a gasket free of any air between the transducer and the hull.

Cover the remaining exposed area around the mounting ring with bilge paint or other suitable coating, to seal the fibreglass/metal again after sanding it.

NOTE: We recommend using a removable thread-lock to lock the transducer in place and prevent it from working loose due to shock and vibration. Make absolutely certain that there are no bubbles under the transducer first!

CONTROL UNIT INSTALLATION

Mounting Control Unit

Even though the main control unit of the Soanar Ultrasonic Antifouling System is fitted inside an IP65 (waterproof) case, it is still essential that the control box is mounted in a position to avoid water ingress and subsequent damage that may result. As such, select a location above the waterline, such as a bulkhead, dry locker or a dry area in the engine compartment away from any external vents or sources of moisture.

Mounting the unit can be performed by carefully undoing the four Phillips-head screws securing down the top cover of the control unit. Remove the top cover and move it aside carefully, making sure not to break any of the wires attached to the LED indicators and switch on the top cover.

With the top cover moved out of the way, in each corner you will see some deeply recessed mounting holes which are **outside** of the grommet groove (159mm x 91mm apart). Mount the Control unit to your desired surface using some suitable stainless steel self tapping screws in these holes. Refer image right.



NOTE: Image shows a quad output unit.

Supplying Power to Control Unit

The Soanar Ultrasonic Antifouling System is powered by a 12VDC supply.

Power should be connected to the battery side of any battery isolating switches, or at a 12V distribution point which has a permanent live supply when the battery isolator is switched OFF.

RED = 12VDC (+)

BLACK = EARTH (-)

It is recommended that you connect the Soanar Ultrasonic Antifouling system with its own dedicated power cable to the battery or power distribution point. The system **MUST** be protected by a fuse or circuit breaker on the positive wire as follows:

YS-5600 Dual Output System = 10A fuse or circuit breaker

YS-5602 Quad Output System = 15A fuse or circuit breaker

The main control unit is supplied with a 5m power input lead with suitably sized cable. It is not recommended to extend this cable to avoid voltage drops and incorrect operation of the low-voltage cut out protection.

Connecting Transducers to the Control Unit

Once fitted and cabling secured, connect the transducer cables to the control box. The connectors are a push-and-twist-to-lock type of connector which can only be inserted in one orientation due to the key. Ensure connections are secure.

RUNNING CABLES THROUGH THE BOAT

As you may be running some long lengths of cable through your boat, it is prudent to ensure that you run your cables neatly and securely.

Plan and check your cable layouts for power and the transducers BEFORE committing to your install locations. This will ensure cables are neatly and safely fitted.

All cable runs should be adequately secured and protected from physical damage and vibration. Avoid running through bilges, doorways or close to moving or hot objects. Despite the cables being waterproof and fire/oil resistant, cables should still be secured up away from water in bilge areas.

If a cable needs to be run through a bulkhead or other obstruction, use a 20mm drill bit/hole saw and check both sides are clear before drilling. Fit a rubber grommet in the hole to protect the cable from abrasion and wear.

Do not coil any surplus transducer cable, as this will affect performance and may cause the cable to get hot. Use a longer cable run to take up any excess cable. See your dealer for extra cable if necessary.

FINAL CHECKS BEFORE TURNING ON

Before turning the unit ON for the first time, check the following:

- Check the power cable. It should be correctly fused, secured and safe from vibrations, abrasion and wear.
- Check the transducer cables. They should be securely connected to the control unit, and cable runs should be secured and safe from vibrations, abrasion and wear. Remember, they should not be coiled.
- Check the transducers. Are they tightened down and no further turns can be made by hand? Did you remember to use the a removable thread-lock to prevent them from working loose?

SYSTEM OPERATION

During normal operation, it is perfectly normal to hear a very slight “clicking” sound when you are close to a transducer. This will indicate that the unit is working normally, and is not a fault.

For best results, it is recommended that the system runs continuously or at least 12-15 hours per day (in daylight hours). You can operate the system on a timer if you need to save on power consumption. If the power switch is left on, the unit will power up as soon as the timer supplies power.

LED Front Panel Indicators

On the front panel of the system, the LED indicators will display the operation of the unit.

LED 1 - “Active/ Low Batt”

- Will illuminate constantly when operating normally
- Will flash when the unit is in low-voltage battery protection mode

LED 2 – “Transducers 1 / 2”

- Will remain on to indicate the output signal is driving transducers 1 & 2
- If this is off, a fault has occurred ie transducer issue, pinched or shorted transducer cable, fuse blown.

LED 3 – “Transducers 3 / 4” (only on YS-5602)

- Will remain on to indicate the output signal is driving transducers 3 & 4
- If this is off, a fault has occurred ie transducer issue, pinched or shorted transducer cable, fuse blown.

Low-Voltage Battery Protection

The Soanar Ultrasonic Antifouling System has a low-voltage battery protection feature included.

This feature monitors the supply voltage provided to the control unit, and puts the system into “shut down” mode if the voltage of the battery gets too low.

This will protect your battery from being over discharged and damaging your boat’s battery.

Low-Voltage Cut Out = 11.8V

Note: When the battery voltage recovers, the Ultrasonic Antifouling System will automatically return to normal operation.

POWER CONSUMPTION AND SPECIFICATIONS

For your Soanar Ultrasonic Antifouling System to work effectively, it needs to be powered and operating constantly, and of course, this is going to be a drain on your battery. This will eventually flatten your battery if you don't apply some kind of battery charging to replace the power consumed by this antifouling system.

Power Consumption:

Model	Version	Daily Power Consumption	Average Current Draw	Peak Current Draw
YS-5600	Dual Output	18.2Ah	750mA	5.5A
YS-5602	Quad Output	28.8Ah	1.2A	8.2A

Some options for battery charging are:

- Mains powered battery charger. Your boat will need to be on a powered mooring for this to be possible.
- Solar panels and charge controller.

Mains Powered Battery Charger

At a minimum, a 3.0A automatic maintenance battery charger is recommended to be able to replace the power consumed by the Soanar Ultrasonic Antifouling System, and be able to keep your battery topped up and maintained.

Solar Panel Charging

For boats not kept in a powered mooring/pen, solar is the next best option to ensure your battery stays topped up and maintained whilst your antifouling system operates. There are some variable factors to consider, but some recommended panel sizes are listed below for various locations around Australia:

Model	Version	Sydney, Perth	Melbourne	Brisbane	Cairns, Darwin	Hobart
YS-5600	Dual Output	120W	160W	80W	60W	200W
YS-5602	Quad Output	160W	240W	140W	100W	300W

These recommendations are based on the average sunlight available in winter months, and are a rough recommendation only for 24 hour operation of the system. A suitable solar charge controller will also be required to efficiently convert the PV panels electrical output to charge the battery.

MAINTENANCE

Whilst there is no actual regular maintenance required for the Soanar Ultrasonic Antifouling System, it is still strongly recommended a periodic check be made on the transducers and that they are in good contact with the hull and have not worked their way loose. If the transducers are shaking loose you can re-tighten them and lock them with a suitable removable thread locker.

Also remember, during operation it is perfectly normal to hear a very slight "clicking" sound when you are close to a transducer. This will indicate that the unit is working normally.

Periodic checking of cabling and connections should also be done to ensure that vibrations have not caused any damage or loosened any connections.

When checking your boat for marine growth, you may still notice some growth along the waterline of the boat. This is unfortunately unavoidable due to water lapping these areas and not remaining submerged, but the growth should only be light and easy to remove with a brush or pressure cleaner.

It is still recommended to periodically slip your boat for regular maintenance, and perform regular checks in the water (with a diver) to check the underside of your boat. You should find with these checks that marine growth, if any, will be significantly subdued, and should be limited to just soft growth that is relatively easy to remove with either a brush or pressure cleaner.

WARNING!

DO NOT swim under the boat for any length of time when the transducers are operating. TURN THE SYSTEM OFF when swimming under or adjacent to the boat.

It is generally a good idea to turn the system off whenever you use your boat, and turn it back on when moored or in a pen.

WARRANTY (2 years)

This product is warranted to be free of faulty materials or workmanship and is covered by an unconditional warranty for 2 years.

NOTE: We cannot cover the workmanship of the installation under this warranty, and as such the warranty does not cover the effectiveness and performance of the system.

Warranty does not cover the cost of replacement house batteries if your battery recharge power fails.

CUSTOMER FEEDBACK

We value our customers' feedback, so if you have installed one of our antifouling systems and would like to provide feedback to us on the effectiveness of the system, please email your feedback to: antifoul@soanar.com