Ultra System SERIES II
Installation Manual

Ultrasonic Antifouling Systems

ULTRA 10
one transducer system

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ULTRA 20
two transducer system
Welcome to the latest Ultrasonic Antifouling Technology

Thank you for choosing the Ultra Series II antifouling system.

It is not necessary to penetrate through the hull to install the Ultra system. All fittings are installed inside the boat and the installation can be accomplished with the boat in or out of the water.

Once installed and switched on, the Ultra system begins to work immediately.

The Series II is the next generation of electronic antifouling. It has taken several years of careful research to optimise the Ultra system and make it fully effective.

Please read and follow these instructions carefully. If you require further advice, please contact our support team on +44 (0) 1202 606185 or email info@ultrasonic-antifouling.com

Important Safety Considerations

WARNING: Product installation

This equipment must be installed in accordance with the instructions in this handbook. Failure to do so could result in poor product performance, personal injury and/or damage to the vessel.

Use the appropriate tools and safety gear when undertaking the installation.

WARNING: Electrical safety

The DC (12/24vdc) power supply must be protected with a 5amp fuse or circuit breaker on the positive power feed (+) / brown wire. This must be carried for each control unit if installing multiple systems.

AC mains electricity installations should be carried out by a competent and qualified person.

CAUTION: Connections into the control box

Ensure power is switched off prior to connecting or removing any cables into the control unit and transducer(s). Failure to do so can cause irreparable damage.

IF IN DOUBT SEEK PROFESSIONAL ADVICE
INSTALLATION

Stages of the installation: Following this schedule will enable best use of time.

- Planning
- Fitting the transducer mounting ring(s)
  *Prepare the hull and fit the ring first, this will allow more time for the epoxy to cure before making the final fitting of the transducer.*
- Fitting the control unit
- Running the power and transducer cables
- Connecting the power supply cable
- Fitting the transducer
- Final connections and checks before switching on

Planning

Plan the layout of your installation and decide:

1. **Where the transducer(s) will be positioned**
   Positioning of the transducer(s) is absolutely critical because incorrect positioning can make the system less effective. Please refer to PAGE 4 for positioning of transducers.

2. **Where to mount the control unit**
   This does not need to be in a particularly accessible location because it requires no maintenance in operation, only to check the red and green LED status lights. It should be placed above the waterline in a dry locker or other suitable place. Consideration should be made for the transducer cable lengths as follows:
   ULTRA 10: 1 x 4m
   ULTRA 20: 1 x 4m + 1 x 8m

   *Extension cables are available if required.*

3. **Source for the power supply**
   The Ultra system requires a permanently live 12/24v DC power supply. Therefore, when you leave your boat with the batteries switched off, the system can continue to operate.
Planning - Positioning of the transducer(s)

Transducers should be sited as follows:

**Ultra 10 System - single transducer system**

In a *sailing yacht*, in the aft area above the shaft and propeller and approximately 200 - 250mm off the centreline of the boat.

In a *powerboat* with conventional shaft drive, a position near the stern gear around the area above the shaft and propeller and approximately 200 – 250mm off the boat's centreline.

In a *powerboat* with stern drives (legs), a position as near to the transom as possible, ideally 100-200mm forward of and approximately 200 – 250mm off the boat's centreline.

**Ultra 20 System - two transducer system**

In a *sailing yacht*, one transducer in the aft area above the shaft and propeller and approximately 200 - 250mm off the centreline of the boat. The second, a third of the way back from the bow or just behind the bow thruster, and approximately 200 – 250mm off the centreline on the opposite side to the aft transducer.

In a *powerboat* with conventional shaft drive, one transducer in a position near the stern gear around the area above the shaft and propeller and approximately 200 – 250mm off the boat's centreline. The second, a third of the way back from the bow or just behind the bow thruster, and approximately 200 – 250mm off the centreline on the opposite side to the aft transducer.

In a *powerboat* with stern drives (legs), a position as near to the transom as possible, ideally 100-200mm forward of and approximately 200 – 250mm off the boat's centreline. The second, a third of the way back from the bow or just behind the bow thruster, and approximately 200 – 250mm off the centreline on the opposite side to the aft transducer.

*If you have purchased an Ultra 20 for a twin engine powerboat under 10 m, follow the instructions above to place both transducers in the stern area.*

**NOTE:** All stern gear is isolated from the hull, so careful positioning will help to protect them.

The above measurements are intended as a guide only. The surrounding structures bonded to the hull should also be considered, such as bulkheads, stringers and supporting / strengthening areas for ‘P’ brackets and sail drives. Avoid siting the transducers close to these structures, it is best to move further away from the centreline onto an area of original solid hull. Incorrect positioning can make the system less effective.

Make sure that you do not site the transducer on any false floor or internal skin. If your boat is a balsa cored or foam sandwich construction, it is vital that it sits on the actual external skin of the hull. A section of the core, approximately 125 – 150mm, should be removed and fully filled with laminates and resin. Ensure each layer is very compressed to avoid creating air pockets. Once completed follow the transducer installation instructions on page 5.
Transducer Positioning Guide

**ULTRA 10 System – boats up to 10m waterline (LWL)**

Transducer at stern close to propeller

**ULTRA 20 System – boats 10m to 16m waterline (LWL)**

One transducer at stern close to propeller(s) and one forward just behind bow thruster position.

Transducer at stern close to propeller and one forward of the keel.

Catamarans require transducers in each hull.

Drawing below shows: Ultra 20 System for hull length up to 10m waterline (LWL)

For multiple transducer systems on vessels over 16m, please refer to the system configuration drawings supplied separately.
TRANSDUCER INSTALLATION

Preparing the hull and fitting the transducer mounting ring:

Before following this procedure... you are looking to make 100% face contact with the transducer face and the inside surface of the hull, so the better you prepare the surface the better the effect. Please note transducers **DO NOT** fit thru-hull. **DO NOT** install transducers outside of the hull in the water.

Failure to follow these instructions will lessen the resonance and reduce the effectiveness of the system.

Preparing the hull surface
The performance of the transducer will not be affected by water in the bilges in actual use. However, it is vital that the surface to which it is to be attached is totally dry and free from grease and dust when the epoxy is applied to the hull.

Carefully prepare the location of the transducer using an 80grit sand paper and sanding block or better still a DA/Random Orbital sander. Prepare a flat and smooth surface removing any coating such as gel wash or any painted coatings on GRP hulls to expose good solid laminate or any painted coatings found on steel and aluminium hulls to expose the bare metal. The mounting ring should sit absolutely flat on this area.

Once this has been done clean the whole area with acetone and make sure it is dry and free from grease and dust.

Preparing the mounting ring
Abrade the underside of the ring flange thoroughly using 80grit sand paper and sanding block to achieve a rough surface to aid bonding. This flange surface should also be free from grease.

Bonding down the transducer mounting ring
Using rubber gloves to protect your hands, mix the epoxy (i.e. Araldite Rapid set) and apply about 1.0 – 2.0mm thickness to the underside of the rings flange.

Locate the ring onto the prepared area of the hull and hold it firmly down until it feels secure. To avoid the ring moving from its position, tape down.

When the epoxy has part cured to hold the ring in position and is still tacky, remove any tape and then use a small screw driver or other pointed tool to carefully remove any excess epoxy from the inside area and around the threads of the ring.

Leave for 24 hours to allow the epoxy to set before fitting the transducer.
Fitting the transducer:

1. Check for any debris or excess epoxy inside the ring area that would prevent the transducer face making direct contact to the hull.

2. Apply a small amount of the supplied silicone grease to the transducer face as shown in the picture on the right. Spread this over the entire face to form a fine layer (skim) of approximately 0.5 – 1.0mm in thickness.

3. Slowly turn the transducer down into the ring using finger tip pressure only until it stops.

4. A slight hydraulic jack effect can be created as the trapped air compresses and slowly escapes through the threads. After 30 minutes or so, check to see if a further turn can be made bringing the transducer into contact with the hull.

5. Connect the transducer cable.

6. Cover the remaining exposed area around the ring with a suitable bilge paint or other coating.

**Note:** After 1 hour it may be necessary just to re-tighten (being careful not to over-tighten) to take up the last little bit. The silicone grease will form a gasket which will eliminate any small air pockets.
ULTRA CONTROL UNIT INSTALLATION

CAUTION: Water Ingress

To prevent the ingress of water and consequent damage to the Ultra control box, ensure that it is mounted to any solid bulkhead above the waterline, in a dry locker or dry area of the engine compartment away from any external vents.

WARNING: Do not open the box. This is not necessary for the installation and will void the warranty.

Mounting the control box.

1. Using the mounting bracket template enclosed, drill 3 holes using a 3mm drill bit.

2. Secure the mounting bracket with 8g Pan Head self-tapping screws. **WARNING:** screw length should be appropriate to the thickness of the panel.

3. Clip the control unit into place onto the bracket.

*Please refer to cable connections for wiring instructions on page 8.*

OPTIONAL AC MODULE UNIT INSTALLATION

CAUTION: Water Ingress

To prevent the ingress of water and consequent damage to the AC Module, ensure that it is mounted to any solid bulkhead above the waterline, in a dry locker or dry area of the engine compartment away from any external vents.

WARNING: Do not open the box. This is not necessary for the installation and will void the warranty.

Mounting the AC Module

The AC Module should be positioned in line next to the Ultra control box.

1. Using the mounting bracket template enclosed, drill 3 holes using a 3mm drill bit.

2. Secure the mounting bracket with 8g Pan Head self-tapping screws. **WARNING:** screw length should be appropriate to the thickness of the panel.

3. Clip the AC Module into place onto the bracket.

*Please refer to cable connections for wiring instructions on page 8.*
Cable Layout

Plan the cable layout for both power and transducer cables.

**Cable runs:** All cables should be adequately secured, protected from physical damage and excessive vibration. Avoid running cables through bilges or doorways, or close to moving or hot objects. Although the Ultra cables are IP68 waterproof and oil and fire resistant, the transducer cables should be secured up in the bilge areas.

A 20mm drill bit / holesaw will be required to run the cable plugs through any bulkheads. Check it is clear and safe on the other side of the bulkhead before drilling through. Rubber grommets are recommended to improve protection to cables that run through holes.

Do not coil any surplus transducer cable together since this may affect the performance. Take a further loop and clip the extra to a bulkhead or within a conduit.

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Electrical Connections

**Power supply: DC Voltage**

The Ultra system automatically operates on 12 and 24v DC systems. The actual operational voltage range is 12 – 32v DC allowing for the higher voltages output from battery chargers and engine alternators.

The power connection should be made at the live input of the battery isolating switch, or at a DC power distribution panel or power BUS which has a permanently live supply when the battery isolator switch is ‘off’.

**Ultrasonic Antifouling Ltd** recommends that power is fed directly to the Ultra system and via its own dedicated cable system and MUST be protected by a 5 AMP thermal circuit breaker or fuse, installed close to the power connection.

The DC cable supplied is prepared for connecting to your boat's DC power supply, with the positive and negative wire tails pre-crimped. **Polarity must be correct.**

Cable colour code:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown</td>
<td>(+) positive 12v/24v</td>
</tr>
<tr>
<td>Blue</td>
<td>(-) negative 0v</td>
</tr>
</tbody>
</table>

**Power supply: DUAL Voltage (DC / AC) – AC MODULE UNIT**

The operational voltage range is 12 – 32v (DC input) and 110 – 240v 50/60 Hz (AC input).

The optional AC module for dual voltage operation requires a DC and AC input supply. For the DC input follow the same instructions above - ‘Power supply: DC Voltage’.

For the AC input, a suitable socket should be provided for the pre-wired cable and AC plug.

**It is not permitted to remove the AC power cable from the AC Module which will void the warranty. The plug can be cut off the cable and changed for another type or to hard wire into the boat’s AC circuit. 5 amp circuit protection is required.**

The DC output cable of the AC module should be plugged directly into the DC input socket of the Ultra control unit.
SYSTEM CONFIGURATION

ULTRA SYSTEM - DC

Ultra Control Unit

Power IN (2-pin)

POWER IN
12v or 24v DC

Transducer 1

Transducer 2 (Ultra 20)

ULTRA SYSTEM - DUAL VOLTAGE

Ultra Control Unit

AC Module

Power IN (2-pin)

Power OUT

POWER IN
110v or 240v AC

POWER IN
12v or 24v DC

Transducer 1

Transducer 2 (Ultra 20)
FINAL CHECKS - Switching on for the first time.

Check the power cable: correctly connected, fused and secured.

Check the transducer cables: connected at both the transducer and control unit and secured.

Check the transducer: it is tight down and no further turn can be made.

When you have checked the installation, switch the power ‘ON’ to the Ultra System.

Your Ultrasonic system in operation

When the Ultra unit is powered up, two status lights will be visible at the top of the control unit. The LED status lights are:

LED: ‘ON’ ☺: system is on. Light pulses at the beginning of every new programme cycle.

LED: ‘SIG’ ☠: ultrasound signal output. Light will continuously flash as it runs the sequence.

You will also hear a very slight double-clicking sound if you are close to the transducer. This is normal and indicates it is operating.

The Ultra system should ideally run continuously. As a minimum it needs to be in operation for between 12 and 15 hours per day (daylight hours) to be effective.

Operation with the Optional Dual Voltage AC Module – 10 and 20

When the two power supplies are connected and switched on, three status lights will be visible at the top of the AC Module unit.

The LED status lights are (reading from the left):

LED #1: ‘AC’ ☺: AC power source available

LED #2: ‘DC’ ☺: DC power source available

LED #3: (not in use)

LED #4: ‘PWR’ ☺: DC power OUTPUT to Ultra System control unit.

MAINTENANCE – Routine Checks

The system does not require any maintenance, but Ultrasonic Antifouling Ltd recommends that transducers are checked to ensure they remain in good contact with hull and have not become loose.

Check the cabling is secure and not damaged.

You may notice a little growth along the waterline where the hull is intermittently exposed to air. There is little that can be done about this other than a deck brush valet occasionally.

If fouling is still apparent in parts of the hull after a few weeks of operation, please refer to the trouble shooting guide at the back of this manual.
Trouble Shooting Guide

There is no output from the Ultra control unit!

- Check LED status lights - Green ‘Power on and start of new frequency cycle’ and Red flashing ‘Frequency output’ - both should be on.
  
  If no green LED on.....

- Check DC battery supply and any fuse or circuit breaker fitted.

- Check AC power supply (optional AC Module only) and any fuse or circuit breaker fitted.

Growth is attaching and the control box is operating (Red and Green LED lights are on)!

- Can a clicking sound be heard at the transducer? The clicking sound indicates an output from the control box to the transducer.

- Has the transducer become loose, can it be turned down anymore?

- Is the transducer making good (100%) face contact with the hull? Is there any debris or epoxy inside the mounting ring area preventing this? Remove the transducer to check the markings on the face.

- Was the inside hull surface prepared correctly to a flat and smooth finish with either the laminate or bare metal exposed?

- Is there any gel on the transducer face? Is there too much? (a skim/thickness of approximately 0.5 -1.0mm is recommended)

- In the case of fibreglass hulls, is the area below the waterline a balsa/foam cored sandwich construction? If yes, the inner core here should be removed to expose the outer skin.

- Is the transducer off the centre line and away from other areas of the hull which have strengthening boards or additional layers of laminate applied to support equipment attached to the hull i.e. ‘P’ brackets, sail drives etc. If not, establish a suitable position following our guidelines.

- Is the transducer to close to a stringer and on the layers that bonds it to the hull? If yes, reposition away from this area.

- Is the unit getting a reliable power supply - battery going flat, power failures or shore power being unplugged?

If you cannot resolve any issue you have or require further assistance, please contact us.