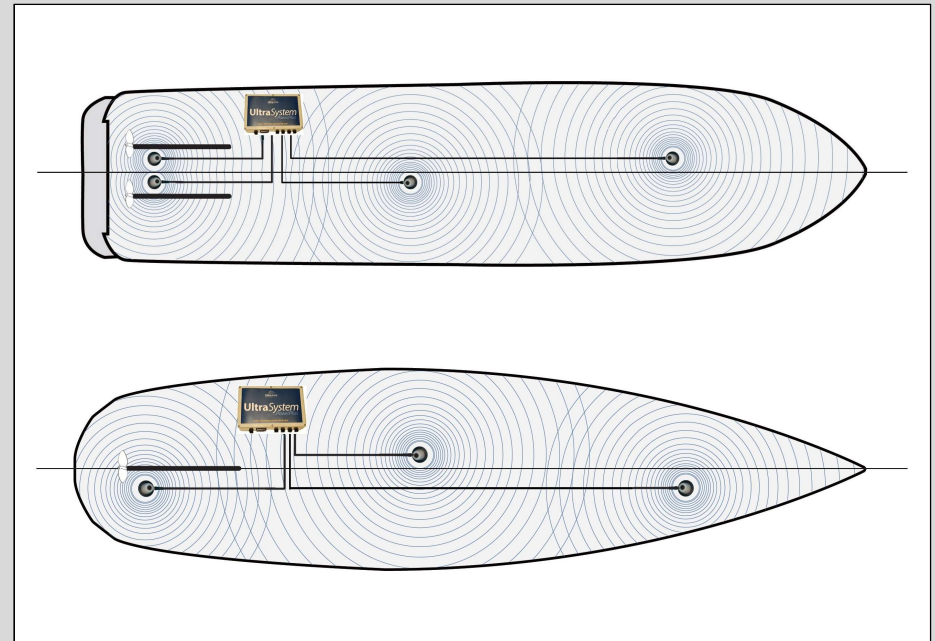


# UltraSystem POWERPLUS INSTALLATION MANUAL



## Hull installation



Manual ref: 01-05-2017

Ultrasonic Antifouling Ltd

Arena Business Centre, Holyrood Close, Poole, Dorset, BH17 7FJ. England

T: +44 (0) 1202 606 185 E: info@ultrasonic-antifouling.com

[www.ultrasonic-antifouling.com](http://www.ultrasonic-antifouling.com)

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## MAINTENANCE / ROUTINE CHECKS

The UltraSystem does not require any maintenance, but it is recommended transducers are checked to ensure they remain in good contact with the hull. Simply hold the transducer to see if it has become a little loose in the mounting ring and turn in to re-adjust.

Check the system is on, the LED lights on the control unit show the operational status.

**Note:** It is possible to find growth appearing around the waterline and this is very normal. This area around the hull is intermittently exposed to the ultrasound due to the lapping of water. The ultrasound disperses into air at the point when it reaches the surface.

## IMPORTANT INFORMATION

The ultrasonic transducers are fitted on the inside of the hull, therefore it is not necessary to penetrate the hull. The system can be installed with the boat in or out of the water.

The UltraSystem has taken several years of careful research and develop to optimise and make it fully effective. **PLEASE READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY.** This system must be installed in accordance with the instructions in this handbook. Failure to do so could result in poor product performance, personal injury or damage to the vessel.

**WARNING: Risk of injury.** Ensure appropriate tools are used and safety gear worn when undertaking the installation.

**WARNING: Risk of electrical shock.** Ensure the power supply is isolated during the installation. Electrical work for DC and AC voltages should be carried out by a competent and qualified person.

**IF IN DOUBT SEEK PROFESSIONAL ADVICE**

**Ultrasonic Antifouling support team:**

T: +44 (0) 1202 606 185 E: info@ultrasonic-antifouling.com



## CABLE LAYOUT

Plan the cable layout for both the power and transducer cables. All cables should be adequately secured, protected from physical damage and excessive vibration. Use existing conduits where possible and protect exposed cables with new conduit i.e. cables in the bilge area running to transducers. Although the ultrasonic cable is waterproof (IP68) and oil and fire resistant, avoid running them in bilge areas that are permanently wet, or close to moving and hot items.

**DO NOT CUT AND RE-JOIN TRANSDUCER CABLE.** If it is necessary to run a transducer cable through a bulkhead, a 20mm drill bit or hole saw should be used to accommodate the plug. Always check the other side of the bulkhead before drilling to ensure it is clear and safe avoiding damage to other items. Use a rubber grommet to protect the cable from chaffing around the area of the hole.

**DO NOT COIL SURPLUS TRANSDUCER CABLE.** Coiling up cable can affect the output. Lay excess cable out over its own length and tie together.

## FINAL CHECKS

1. Check the transducer cable: connected at both the transducer and control unit.
2. Check the transducer: tight down and no further turn can be made....in good contact!

## PLANNING THE INSTALLATION

Planning the installation will allow best use of time. It is suggested to follow the schedule below.

1. Read all manuals in full to understand what is required for each element. Make notes if necessary.
2. Plan the layout of the system and decide on:
  - a. **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 3 for positioning of transducers.
  - b. **Where to mount the control unit.** (*see separate manual for control unit*)

Consideration should be made for the transducer cables lengths that will connect from the control box to the transducer(s).

Cable length supplied: 8m per transducer unless specific lengths have been ordered for this system.

Extension cables are available if required in 4, 8 and 10m lengths.

3. Install the transducer mounting ring(s).  
*Undertake the fitting of the ring first. This will allow more time for the epoxy to cure before inserting the transducer.*
4. Install the control unit.
5. Run the power and transducer cables.
6. Make the electrical connections.
7. Install the transducer into the mounting ring.
8. Make final checks and switch on.

## TRANSDUCER POSITIONING

It is very important to ensure transducers are correctly positioned on the inside of the hull. **For a guide to positioning, please look at the configurations shown on the next pages, 4 and 5.**

The measurements given on this page are approximate and intended for general guidance. The final position of a transducer will depend on the access and surrounding structures of the hull, such as bulkheads, stringers and supporting / strengthened areas for 'P' brackets and the keel. Avoid positioning the transducer close to these structures, it is better to move further away from the centreline and any structures, in order to install the transducer on an area of original solid hull where no additional tabbing layers have been applied to support these hull parts or strengthen the hull.

### Three and four transducer installations (1 x PowerPlus system)

The first transducer is installed in the stern area of the hull near the propeller and at least 200mm off the centre line to one side. The remaining transducers should be installed in a diagonal arrangement going forward with the last transducers installed approximately one third of the way back from the bow or just behind the bow thruster. For a sailing yacht, just forward of the keel.

### Multiple transducer installations (Combination of two or more Powerplus Systems)

Transducers should be positioned with the same considerations as described above and the additional transducers for a longer hull should continue forward in the same diagonal arrangement as shown in the relevant system configuration drawings with spacing between each transducer approximately equal.

### Notes for installations to Powerboats:

1. Where two transducers have been selected to provide additional protection at the stern of a twin drive power boat, place one transducer in the proximity of each propeller.
2. Powerboats with Stern Drive units, position the transducer near the transom, approximately 150mm away, and at least 200mm off the centre line. If this is not possible due to restricted access, a position at the front of the engine can be selected.

### DO NOT INSTALL THE TRANSDUCER ON ANY FALSE FLOOR AND INTERNAL SKIN OR LINER.

If the hull is cored (Balsa/Foam) known as sandwich construction, the transducer must make contact with the external skin of the hull. Additional work will be required to remove a 150mm diameter section of the core then filling in with new laminate and epoxy to strengthen and seal. It is imperative that the new layers are compressed and no air is trapped in the layers. Ultrasound does not work through air!

*image: Mounting ring bonded inside the hull. The inner contact area is free of debris and excess epoxy.*



### Fitting the transducer into the mounting ring.

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 silicone grease (supplied) to the transducer face. Spread over the entire face to form a fine layer of approximately 0.5 to 1.0mm thickness.
3. Slowly turn the transducer down into the ring using only fingertip pressure until it stops where the face has come into contact with the hull.
4. After 30 minutes or so when any trapped air has escaped through the threads, it may be possible to turn the transducer in a little more to ensure contact has been achieved.
5. Connect the transducer cable.
6. Cover the surrounding prepared surface with a suitable bilge paint, flow coat or other coating.

*image: silicone grease is applied to the transducer face. This forms a gasket to eliminate any small air pockets.*



*image: transducer installed to the hull.*



## TRANSDUCER INSTALLATION

### Preparing the hull's inner surface and fitting the transducer mounting ring.

#### Stage 1

image: prepared surfaced



#### Stage 1 - Preparing the hull surface.

Carefully prepare the location of the transducer using an 80grit sand paper and sanding block. An electric sander can also be used. If the surface is very uneven, starting with a 40 grit paper will make it easier. Prepare a **flat and smooth** surface. With GRP (fibreglass) hulls, sand down to the laminate removing any coating such as gel wash or other bilge paint. For steel and aluminium hulls remove any coating to expose the bare metal.

**The mounting ring should sit absolutely flat on the prepared area.**

**Clean the whole area with acetone and make sure it is dry and free from grease and dust.**

#### Stage 2 - Preparing the mounting ring.

Abrade the underside of the ring flange thoroughly using 80 grit sand paper to achieve a rough surface to aid the adhesion.

*Keep the flange surface free from grease and water.*

#### Stage 3 - Bonding the transducer ring to the hull.

Using rubber gloves to protect your hands, mix an excellent quality epoxy (i.e. Araldite Rapid set) and apply a layer of about 2.0mm thickness to the underside of the ring flange. *Too much may result in excess epoxy entering the centre contact area and prohibit the transducer face making contact!*

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.

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

#### Stage 2

image: sanding ring flange



#### Stage 3

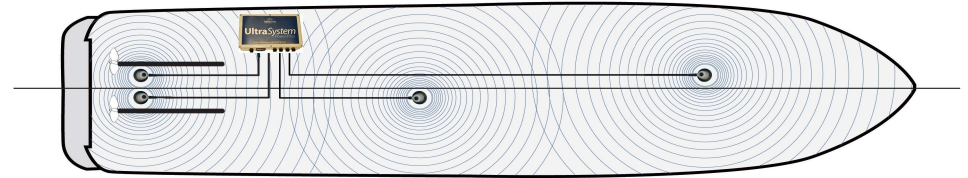
image: applying the epoxy



## POSITIONING FOR MOTORYACHTS

Hull waterline length (LWL) 16m to 22m

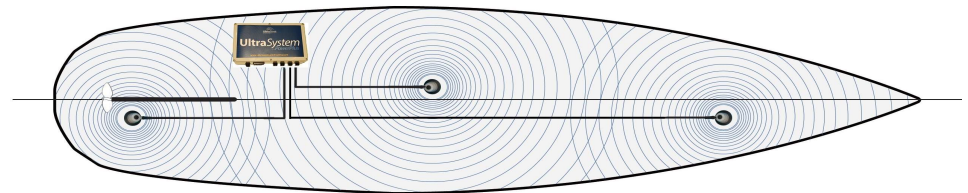
1 x UltraSystem PowerPlus – four transducer system



## POSITIONING FOR SAILING YACHTS

Hull waterline length (LWL) 16m to 22m

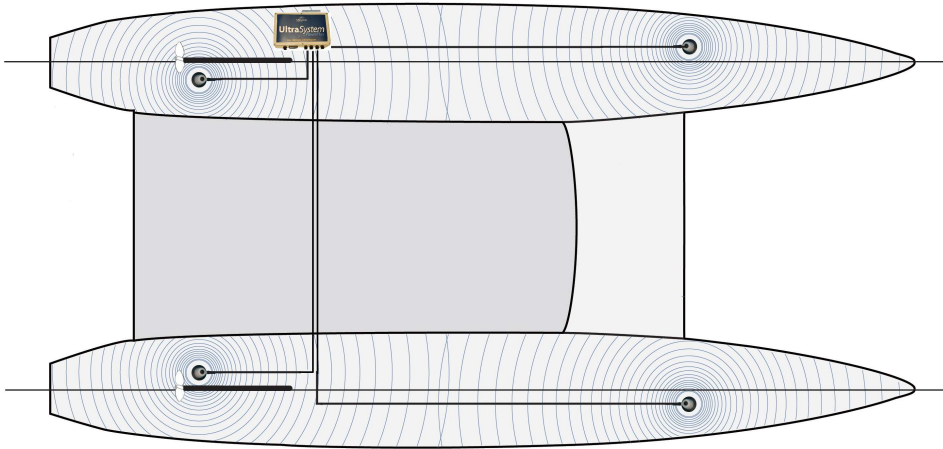
1 x UltraSystem PowerPlus – three transducer system



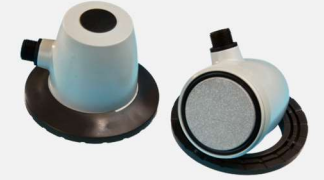
## POSITIONING FOR MULTI-HULLS

Hull waterline length (LWL) 10m to 18m

1 x UltraSystem PowerPlus – four transducer system



## TRANSDUCER INSTALLATION



**DO NOT** fit transducers thru-hull. Install on the inside surface of the hull.

**DO NOT** install transducers outside of the hull in the water.

**DO NOT** install the transducers where they will become submerged on a regular basis.

Correct installation of the mounting ring and transducer is critical to the systems successful operation. The direct contact of the transducer face to the hull transmits the signal into the hull form, allowing the sound waves to resonate.

### Guide notes:

- b) You are looking to achieve 100% contact of the transducer face to the hull. So the better you prepare the surface, the better the effect.
- c) Ensure your chosen position is not difficult to work on. It is critical to make a good job of the fitting, than making a poor effort due to working restrictions.
- d) Do not install on or close to the centre line. Keep off by a least 200mm.
- e) Keep at least 200mm away from stringers, bulkheads and other areas that have additional laminate layers applied.
- f) The transducer must be below the hull's waterline.
- g) Ensure the surface is prepared flat and smooth before bonding the mounting ring.
- h) Ultrasound does not transmit through air, the supplied silicone grease allows any minor air pockets between the transducer face and hull surface to be expelled.
- i) The transducer face must make a direct scratch contact to the hull. Too much silicone grease will prevent this.
- j) Do not over tighten the transducer.

**Failure to follow the installation procedure on pages 7 and 8 correctly will reduce the resonance and reduce the effectiveness of the system.**