

## AF400 PRO - INSTALLATION INSTRUCTIONS



### SAFETY

- Exercise caution when working on the vessel, especially in confined spaces or when working near the bottom or “bilge” area of the boat.
- Make sure the work area is properly ventilated prior to beginning installation.
- These areas may contain residual fuel or fumes that can be harmful when inhaled.
- Extreme vigilance should be used in these spaces especially when working alone.
- A basic understanding of drilling, sanding and the vessel’s electrical system are needed for the installation work required.
- The equipment must be installed in accordance with these instructions.
- Failure to do so could result in poor product performance, personal injury and/or damage to the vessel.
- The success and performance of the system depends on a quality installation.

### CLEANING OF THE HULL

- It is important to clean the hull close to the time of the installation.
- Barnacles and mussels, are not killed by this system.
- This system kills the micro-organisms at the bottom of the food chain.
- Algae and other vegetation are killed and consequently the barnacles & mussels that feed on them will not attach to the hull.

### ITEMS SUPPLIED

Included in this delivery:

- Control Box Unit AF404C or AF404CD
- Transducers AF401T.
- Two cable glands 12 mm for control box.
- Blanking plug for unused cable inlet of control box if not used.

## Options if ordered

- AC shore power supply LPF60-30
- Transducer mount plate and 10mm screw (One for each transducer)
- Transducer cables 1 RG6 coaxial cable for each transducer, lengths as ordered.
- One tin of Isopon or Devcon epoxy resin to bond transducer to transducer mount.

## INSTALLATION

### Planning & Positioning

Before beginning work it is important to plan out the installation, taking note of:

- The vessels hull design.
- Location for the transducers and control box.
- Cable runs and power supply.

### Location of Control Box

- The control box is sealed and water resistant so can be installed in the most convenient location, preferably above the water line.
- The length of cables to the transducers should be taken into consideration for the location of the control box.

### Hull Construction

- Ultrasonic sound waves will only work properly on fibreglass, aluminium and steel hulls.
- The system is not suitable for wooden hulls.

### Hull Mounting

- Transducers must be bonded directly to the hull of the boat. Special care must be taken to ensure that they are not bonded to a false floor, cavity, over a keel, or on the inner layer of a balsa/foam cored boat.
- A direct connection to the hull may require removing any spacing or other layer such as a sandwich foam or balsa core.
- If working with steel or aluminium, be sure not to connect over welds or seams in the material.

### Obstructions

- Avoid mounting transducers close to any objects such as stringers, bulkheads, water tanks, fuel tanks, transoms, depth finder and fish finder.
- Ideally, they should be 30 cms away from these areas for the system to operate most effectively.

### Transducer Positioning

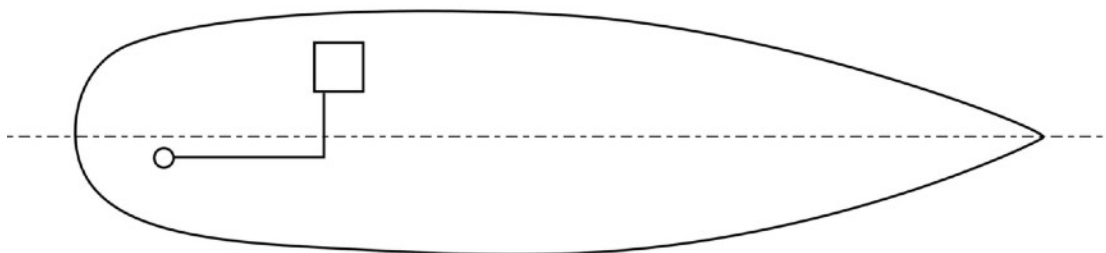
- The diagrams below show the general optimum areas for mounting transducers, since every vessel is different. The illustration should be used as a general guide only.
- On smaller power craft under 10m, the transducer should be positioned in the close proximity of the propeller and shaft to help protect these isolated parts.
- Transducers should be fitted onto a solid part of the hull, see under hull mounting above.
- They should also be approximately 30cms off the centre line.
- For stern drive units, transducers should also be approximately 10 to 13cms forward of the transom.

These measurements are a guide only, but the surrounding structures in the vessel will determine the final position.

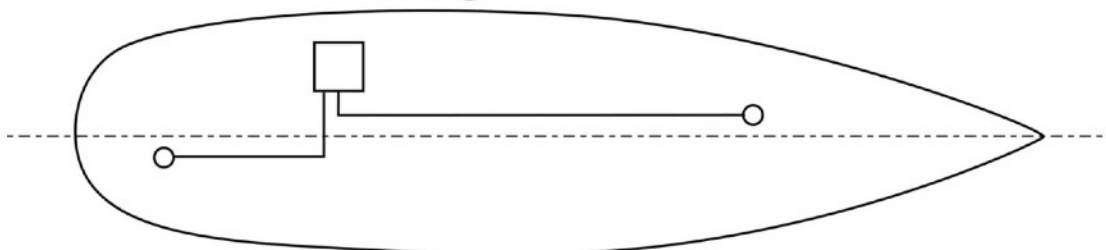
A reasonably flat area of the hull should be chosen for transducer locations and the surface should be well prepared before mounting (see preparation and mounting instructions below).

### Typical Position Sailboat:

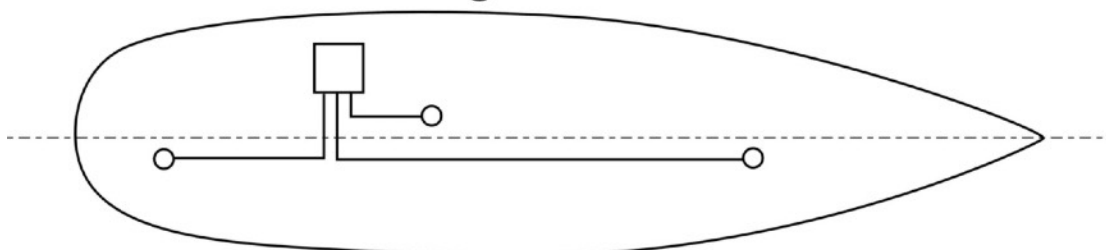
#### Typical Position for Sail Boat Up to 10 m Water Line Length



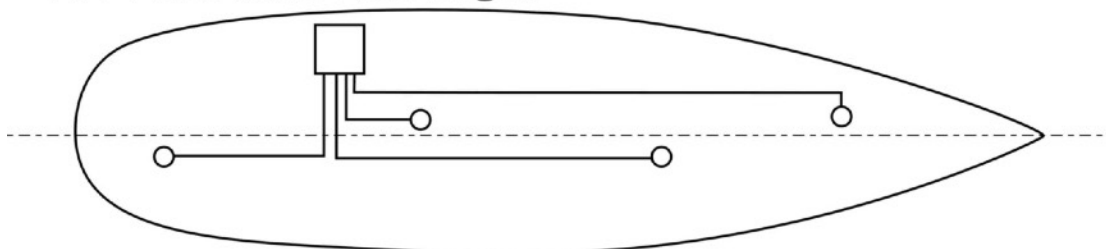
#### Typical Positions for Sail Boat 10 -16 m Water Line Length



#### Typical Positions for Sail Boat 16 - 22 m Water Line Length

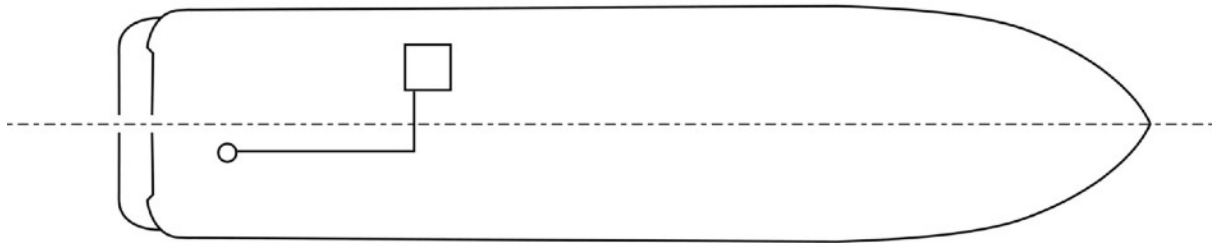


#### Typical Positions for Sail Boat 22 - 28 m Water Line Length

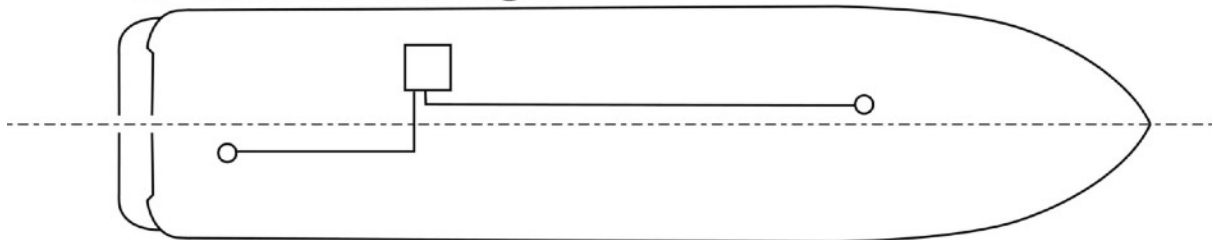


## Typical Position Power Boat:

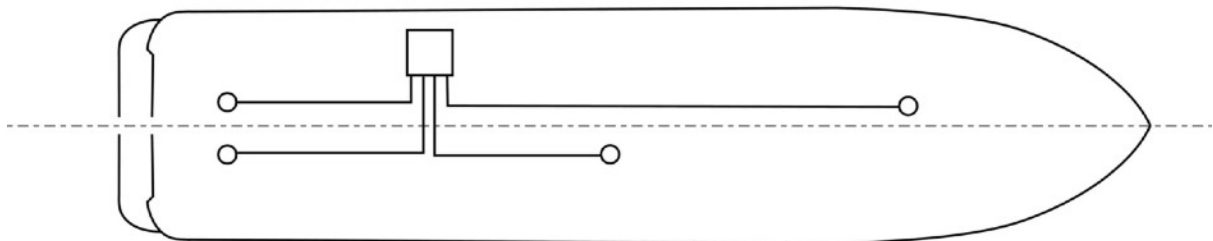
**Typical Position for Power Boat  
Up to 10 m Water Line Length**



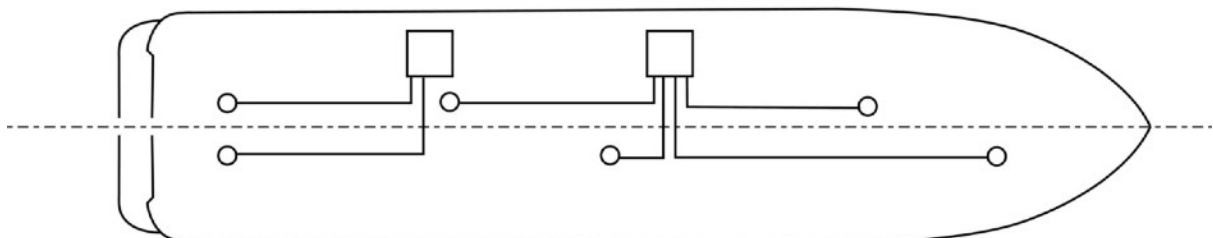
**Typical Positions for Power Boat  
10 - 16 m Water Line Length**



**Typical Positions for Twin Screw Power Boat  
16 - 22 m Water Line Length**



**Typical Positions for Twin Screw Power Boat  
22 - 28 m Water Line Length**



## Location and Installing of the Control Box



AF404C Control Box



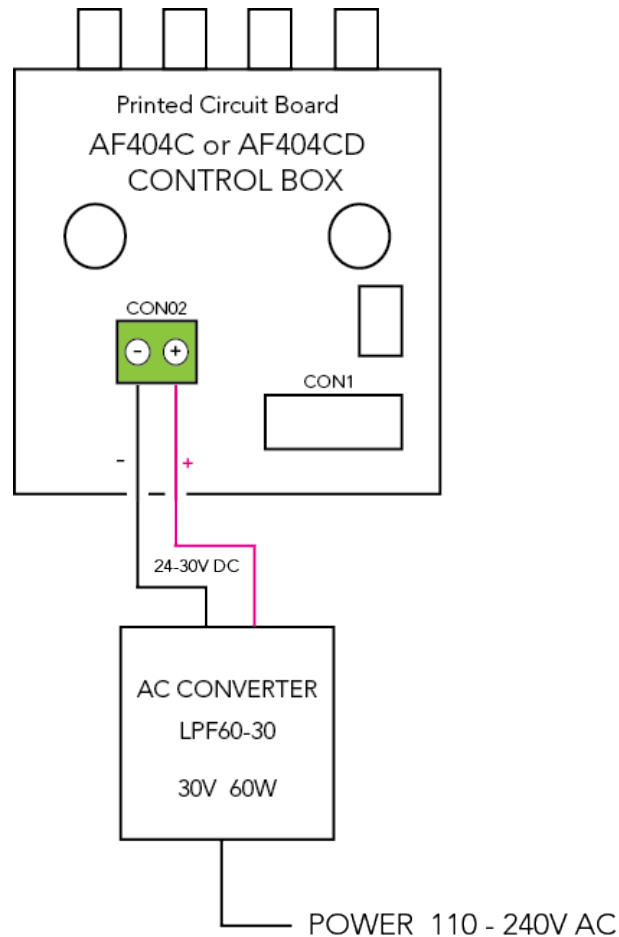
AF404CD Control Box

The control box is splash proof to IP66 and can be installed in any convenient location, preferably above the water line.

1. Unscrew the four screws on the cover of the control box. These screws will not un-screw completely, as they are designed to stay with the cover. Remove the cover and place it aside.
2. The mounting screws are placed in the same holes as the cover screws. Use four suitable screws to secure the control box.
3. Mark the location for the four corner mounting screws. Using a drill bit, drill the mounting holes. Use caution to make sure that you are not drilling into the hull of the boat. The mounting screws are placed in the same holes as the cover screws. Use four suitable screws (not supplied) to secure the control box.
4. AF404C Remove the cover and place it aside. AF404CD Remove the connector on the PCB by lifting the 2 tabs each side of the IDC connector and put aside.
5. Locate the 30 volt DC power source. This can be either a protected circuit from vessels electrical panel, or it can be direct to the battery via a local 5 amp fuse or circuit breaker (29.6 volt for fully charged battery). Use stranded cable rated at 5 amps or more. Leave switched off until testing the installation.

## Connecting the AC Converter to the Control box

1. Connect cable from terminal -, negative and +, positive via the supplied cable gland to a suitable permanently on, protected 24 volt vessel DC supply. Note connecting cable wrong way round does no damage, but will not work.



2. Most important to wire the cables of the LPF60-30 power supply correctly or severe damage will occur.
3. Ribbon cable and connector from the display assembly should be plugged into the connector on the back assembly just before closing the control box.
4. Make sure the front assembly is not allowed to hang un-supported on the cable before closing the box.
5. Replace the cover.

## Mounting the Transducer to the Hull

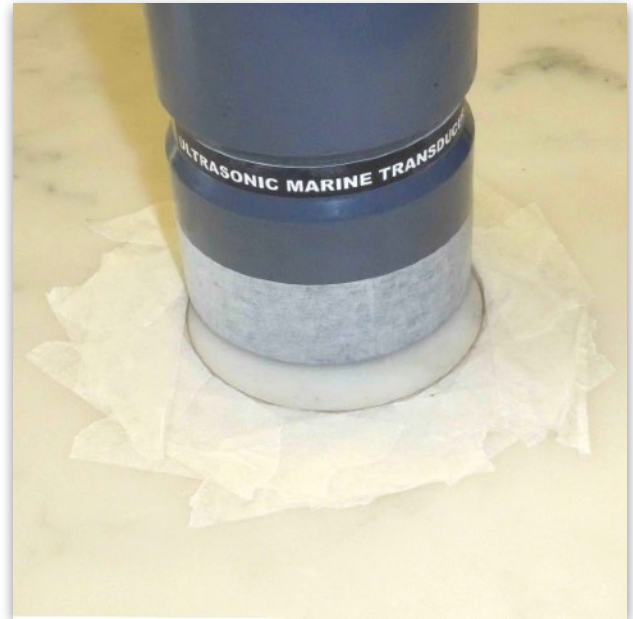
When mounting transducers, the goal is to make 100% contact between the transducer and the hull. The optimal location is if surface is flat and clean. The better you prepare the surface, the better the result.



To make a neat and tidy installation, proceed as follows:-

1. Cover face of the transducer with a thin coating of Isocon or Devcon smeared on the face of the transducer.
2. Degrease the general area where mounting the transducer and also degrease the face of the transducer using either isopropyl alcohol, methylated or surgical spirit.
3. Draw a pencil circle around base of transducer as photograph number one below, abrade hull within this circle using medium grade sandpaper. Mask around circle as in the photograph two below. Also mask lower part of the transducer.
4. Following the Devcon instructions, install each transducer one at a time. Place transducer in center of masked area and push down hard to expel surplus Devcon. Masking tape should be used during bonding to keep the transducers in place on sloping parts of the hull. After about three minutes, depending on temperature, run around perimeter of transducer with a sharp pointed blade and ease surplus away.
5. Allow 1 hour for Devcon to set before removing the masking tape which should come away with the surplus Devcon. Take care not to disturb transducer during the above process while the Devcon sets.





## Connecting Transducer to Control Box

### Transducer Cables

- Having mounted the transducers and control box, the cables can now be connected to the units.
- Up to four transducers can be connected to a single control box.
- Maximum 60m cable length per transducer.
- Cables have F type connectors. We can supply F connectors with integral o-rings.

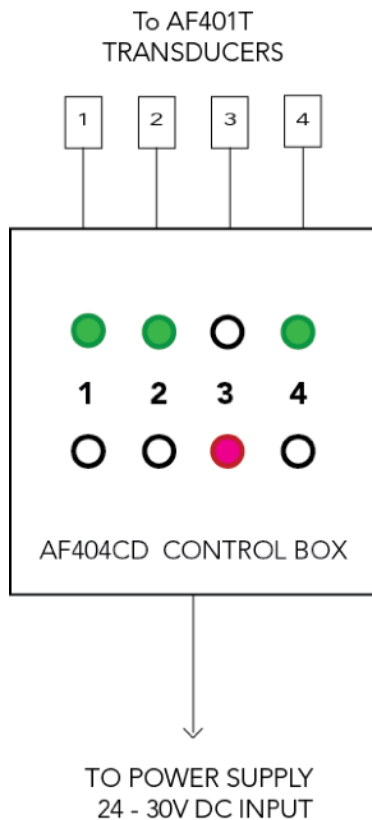


## TESTING THE SYSTEM

### AF404CD (Version with display)

- This version has automatic monitoring of all the functions of the control box.
- There are 4 separate circuits which work on their own, separate from the processor.
- On first switching on, all red LEDs will be on during initial testing of all circuits.
- This testing can take more than 30 seconds and have random finish time for each channel when the green LEDs will display all is OK.

In operation, red LED will flash and green will turn off when a fault occurs in that channel.



Channel 3 in Alarm

### AF404C and AF404CD

- If input voltage is too low, or a processor fault, a red LED on the main PCB will continually flash.
- A green flashing LED shows input voltage OK and processor working correctly.
- Note a transducer or cable fault will be displayed on the transducer itself. The transducer green LED flashes for 1 second every 4 seconds if all working correctly in the transducer and its cable.
- Note a faint glow will show in the dark on the transducer LED to show that power is connected.

### Technical Support

If your system is not working and you are unable to resolve the problem,  
Please contact: [laurence@ultrasonicmarine.co.uk](mailto:laurence@ultrasonicmarine.co.uk) for help.

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Version 3.0 24<sup>th</sup> February 2020