

AF400 PRO SERIES - DATASHEET



ULTRASONIC MARINE ANTIFOULING SYSTEM

Ultrasonic Marine anti-fouling uses ultrasonic sound waves to kill micro-organisms and bacteria that attach themselves to unprotected ship hulls. These micro-organisms are a food source for barnacles and mussels. When you eliminate the environment where these micro-organisms live and thrive, then you eliminate growth of barnacles and mussels.

Ultrasonic Marine anti-fouling system creates sound waves that move water molecules over the underwater profile of your ship's hull. The system consists of digital control box connected to a number of transducers. The transducers are fixed directly to the inside of the ship's hull and the control at a place of your choosing.

Properly installed and maintained the USM anti-fouling system will not only help keep the hull clear but also rudders, props and keels clear too. A cleaner hull will not only give better fuel efficiency but also less time spent in a dry dock.

- Affordable initial costs and long term savings.
- Low consumption – typically under 4 watts per transducer.
- Minimal installation – no holes are needed in the hull.
- Active transducers to eliminate interference to other equipment.
- Suitable for glass-fibre, aluminium & steel hulls.
- Designed & manufactured to military standards. Built to the same standards as our military products which have included items for Awacs, B2, Apache & Chinook helicopters, C130 and nuclear submarines.
- Designed originally to the requirements of the UK Royal Navy.
- Designed and manufactured in the U.K.
- Enhanced transducer output and drives longer transducer cables than AF300 series.



Ultrasonic Marine is a division of Citadel Products who have over 50 years experience in ultrasonics having originally designed and manufactured transducers for intruder alarms.

CONTROL BOX AND TRANSDUCER

Installation consists of a control box with status LEDs.

Size 110 x 120 x 67 mm deep.

The active transducer has a status LED to show correct operation. It measures 57 mm x 100 mm high.

Transducer is to IP68 & the Control box to IP66 environmental protection.

Care has been taken to exceed the requirements of the CE specifications to avoid electromagnetic interference to other equipment nearby.

Connections between control box and transducers are by screened coaxial cables.



CONTROL BOX

There are 2 versions of the control box - the [AF404C](#) (shown above) and the [AF404CD](#) (which has an additional status display). There are inputs for a 24V DC ship's supply and also for the optional 110/230 volt AC power supply to run from a shore supply.

An alternative solar supply can be used instead of the shore supply and should be rated at least 80 watt output according to where the vessel is based and number of transducers installed.

The outputs will drive up to 4 transducers which are connected by our standard RG6 cables. Maximum length of each run should be less than 60m using RG6 specification cables with F connectors fitted at both ends.

They can be made up on site using standard RG6 satellite cable or supplied ready terminated with waterproof connectors in the following standard lengths: 5 & 10 m, or custom lengths are available.

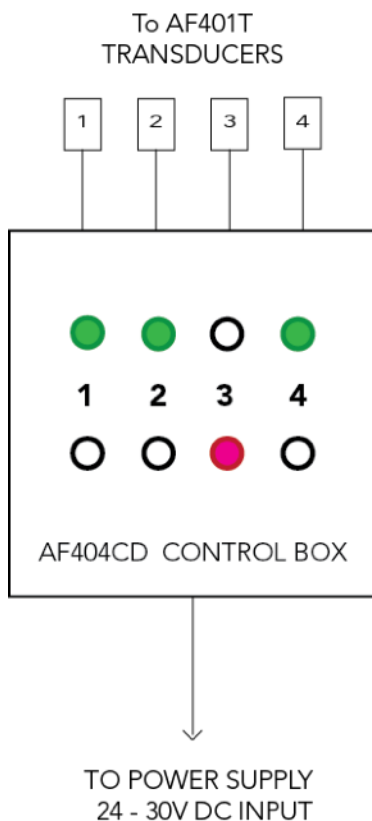


AF404CD Control Box

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.



AF404C and AF404CD Control Boxes

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.



Transducer has LED to show status.

The active transducers contain all the high voltage drive circuitry.

This eliminates interference to other equipment through radiation from a long cable from the control box. We use a 24 volt AC feed with control signals.

Transducer showing transmitting face.

The transducer is simply bonded to the hull using Devcon epoxy resin.

A reasonably flat area should be chosen on the hull and sanded clean to key the surface and improve adhesion.

Only glass-fibre, aluminium or steel hulls are suitable.

Stainless studs shown in picture can be supplied for welding to water and oil tanks to help in the installation of the transducer.



Guide to typical number of transducers :

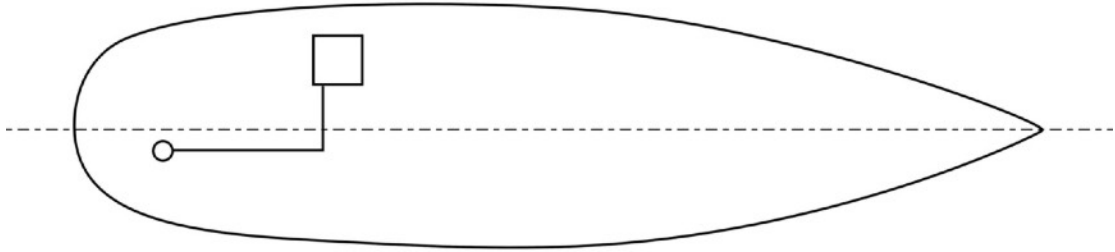
32 m - waterline length - twin screw = eight transducers.

Twin screw vessels should preferably use an extra transducer.

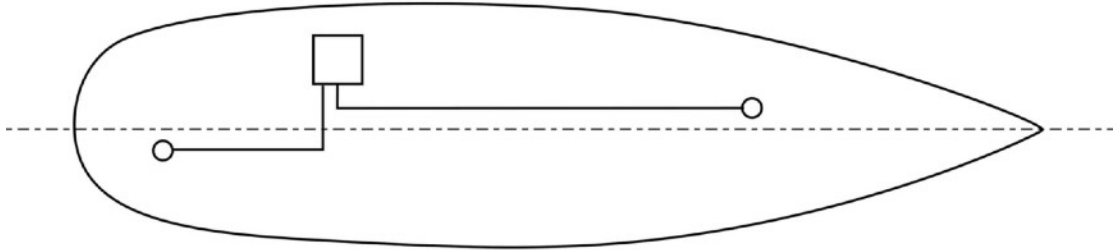
See diagram below of suitable positions:

Typical Position Sailboat:

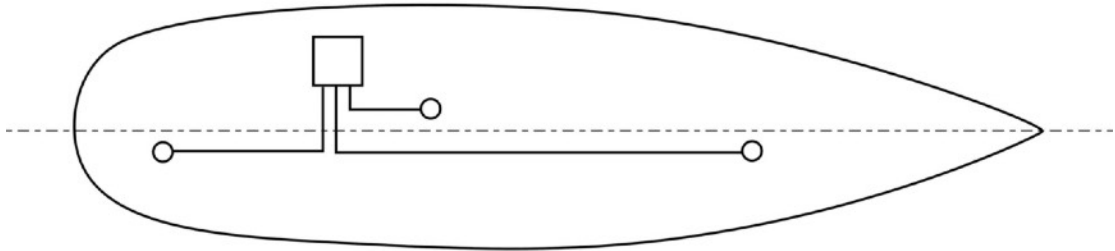
**Typical Position for Sail Boat
Up to 10 m Water Line Length**



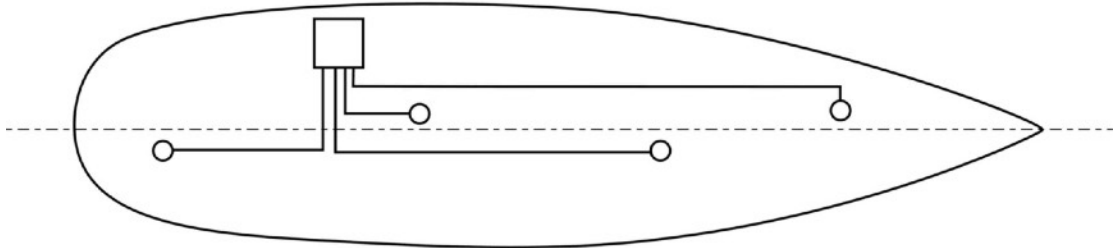
**Typical Positions for Sail Boat
10 -16 m Water Line Length**



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

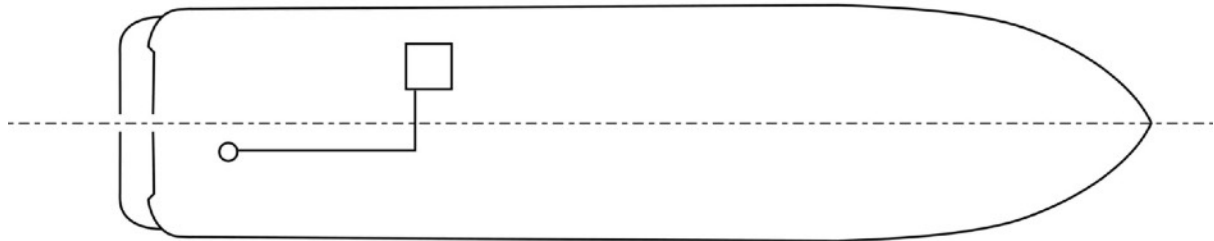


**Typical Positions for Sail Boat
22 - 28 m Water Line Length**

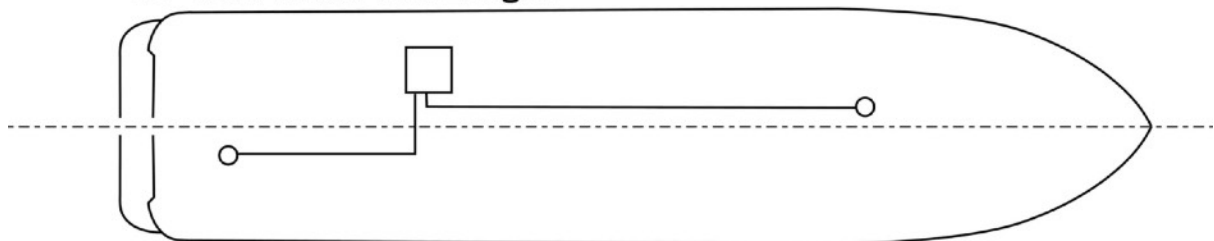


Typical Position Power Boat:

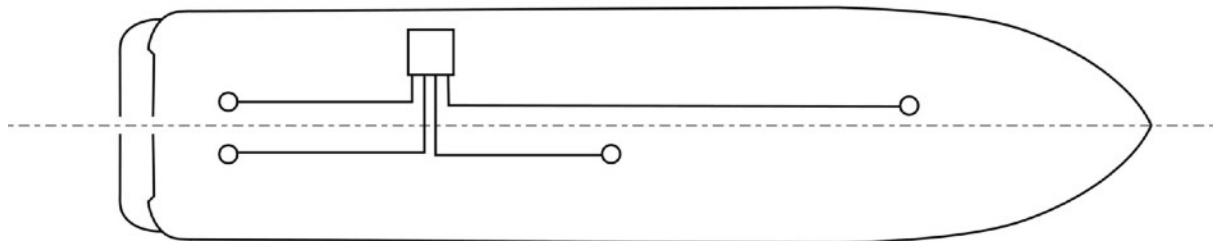
**Typical Position for Power Boat
Up to 10 m Water Line Length**



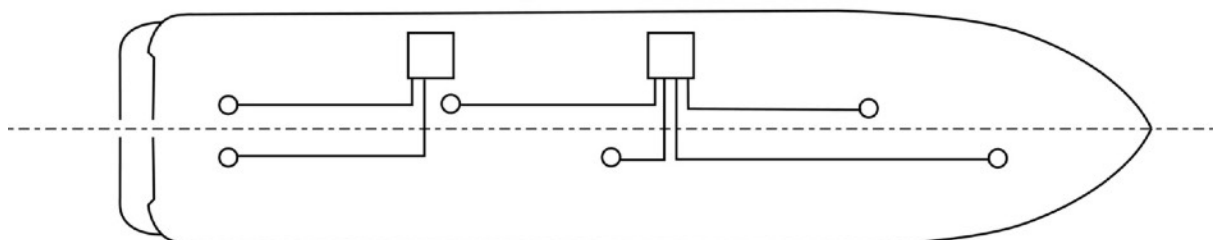
**Typical Positions for Power Boat
10 - 16 m Water Line Length**



**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**



Specifications:

CONTROL BOX AF404C & AF404CD

Input voltage 22V to 30.5V DC

Average consumption 4 watt maximum per transducer.

Operation -40 to +60 degrees C

Polycarbonate enclosure with IP66 environmental protection.

Drives up to 60 m transducer cables.

Size 11 x 12 x 6.7 cms

TRANSDUCERS AF401T

IP68 environmental protection.

Operation -40 to +60 degrees C

Size 10 x 5.7 cms

Order codes:

Control box AF404C or AF404CD

Transducer AF401T

Power supply LPF60-30

Peak Output Up to 60W

(State number required)

(For 110V/230V AC OPERATION)

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