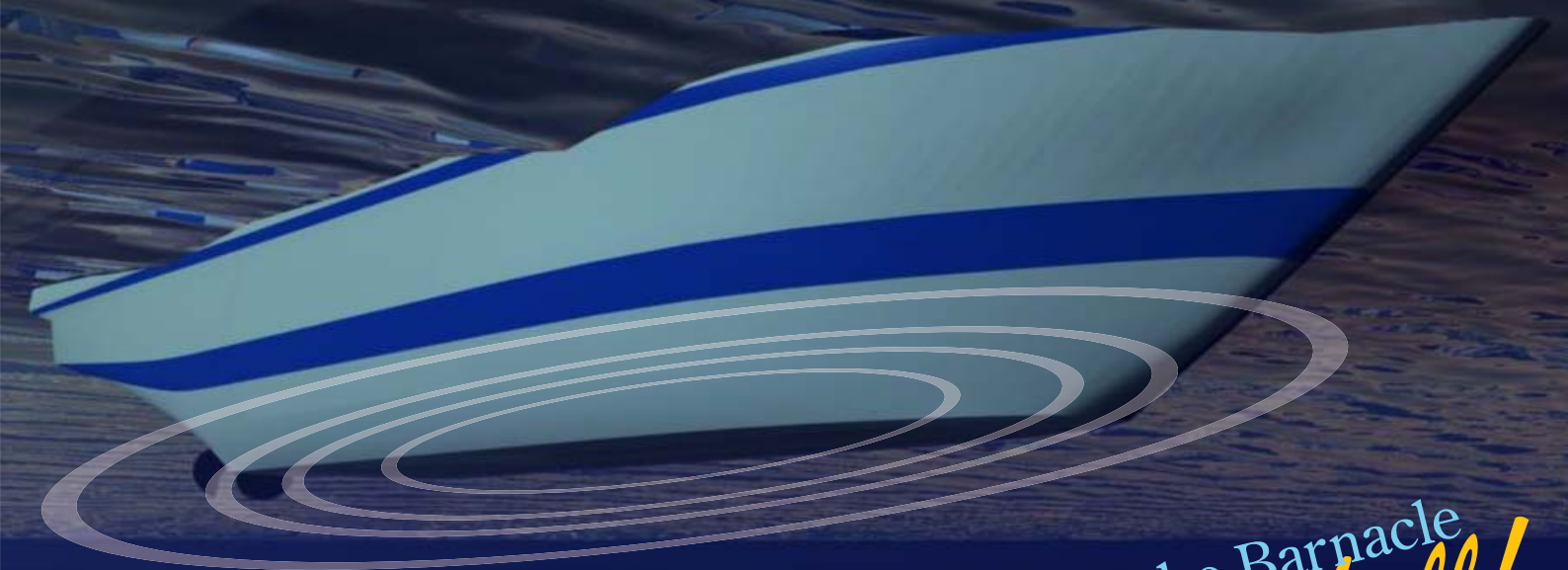


EASY TO INSTALL
NO HULL PENETRATIONS REQUIRED



SONIHULL

Ultrasonic Antifouling System



Banish the Barnacle
with **Sonihull!**



SONIHULL

NRG MARINE is a division of NRG Solutions

NRG Solutions is a high tech company specializing in the design and development of environmentally friendly electronic solutions for specialist and environmentally aware projects, such as Building automation and controls. And now the latest addition to the NRG Solutions is the NRG MARINE division.

NRG Marine developed and produce:

- NRG Sonihull Ultrasonic Antifouling System for yachts of all sizes
- NRG AMC - Alarm Monitor and Control SMS based full control security solution

SONIHULL

For hundreds of years mariners have been plagued with the same old problem of marine growth on the hull, power train and steerage gear of their yachts. With this comes the problems of:

- Reduced speed, due to extra drag
- Increased fuel consumption, estimated at as much as 20%
- Propeller cavitation (which in turn causes extensive damage to propellers)
- Expensive annual haul outs and repainting costs.





DOES IT REALLY WORK?

Although the concept of using ultrasonic for keeping your boat hull clean is a relatively new application, the concept of ultrasonic cleaning is not new, it has been around for over 30 years, used for a wide variety of applications, from cleaning of dental and medical equipment, fine jewelry, through to de-gunging drains and automotive parts to name but a few, also, in a subject closer to sailors hearts Ultrasonic's is also used for keeping pipes clean in many breweries and hostelrys around the world.

Over the past decade, environmental issues have meant much tighter controls on industrial cleaning products especially chlorofluorocarbons, with "necessity being the mother of all inventions" industry needed to find an alternative solution. Ultrasonic cleaning was considered the most viable solution, by embracing the latest in digital electronics and transducer technology, the industry made a quantum leap forward over the last decade to fill the needs of industry.

HOW DOES IT WORK?

The NRG Marine Hull protection system utilizes the latest digital electronics and Ultrasonic transducer technology, by producing multiple bursts of ultra sonic energy simultaneously in a multiple range of frequencies. This energy produces a pattern of alternating positive and negative pressure.

The alternating pattern creates microscopic bubbles during periods of negative pressure and implodes them during periods of positive pressure in a phenomenon known as "cavitation." The implosion creates a micro-jet action that not only provides the cleaning effect on the hulls surface below the water line, it also resonates and destroys single cell organisms such as algae. The removal of the initial link in the food chain inhibits the growth of barnacles and other marine life that feed on the algae.



SONIHULL



THE BENEFITS

SONIHULL WILL REDUCE YOUR FUEL BILLS

A clean hull can save you about 20% of your fuel bills. It is common knowledge that fouling on the boat's hull will lead to increased resistance, which basically means you are going to burn more fuel for every knot you make. The outcome is a compromised efficiency and more fuel usage than with a clean hull.

ENVIRONMENTALLY FRIENDLY

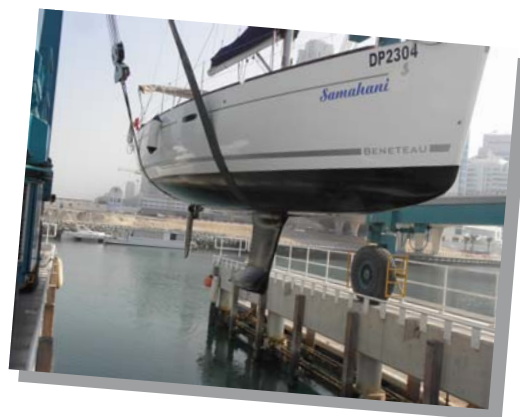
Tests show that there is no danger to fish, (but if they can hear the ultra high frequencies and don't like it, they only have to swim a few more inches away from the hull to avoid the problem!)

After one year with Sonihull and the pictures speak for them selves.

The owner stated that within the first two weeks he knew it was working as previously every two weeks he would have to degunge the speed log paddle wheel. In the last year he has not had to do it once!

SIMPLE INSTALLATION

- No hull penetration required
- Transducers are simply bonded to the inside of the hulls outer skin.
- For yachts up to 30ft. transducer should be installed in the rear 3rd of the yacht.
- For yachts up to 56ft. transducers should be installed 1/3 and 2/3 along the centre line of the yacht hull.
- Catamarans up to 30ft. transducers should be mounted on the rear 3rd of each hull.
- Catamarans up to 56ft. 2x SoniHull Duo system are required one for each Hull, and to be installed similar to mono hulls with spacing of 1/3 and 2/3 along the hull centre line.



Pictures of boat being removed from Dubai's fertile waters after 1 year with SONIHULL



POSITIONING FOR INSTALLATION



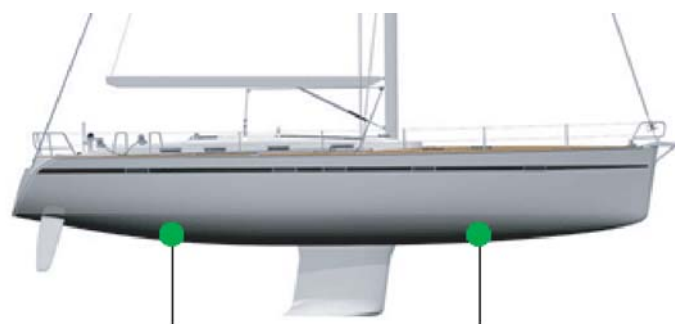
Sonihull Mono Positioning



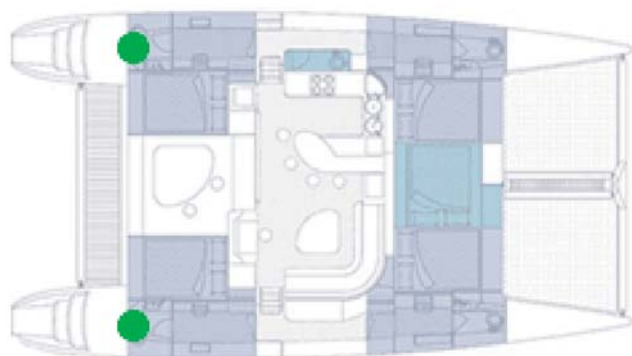
Sonihull Duo Positioning



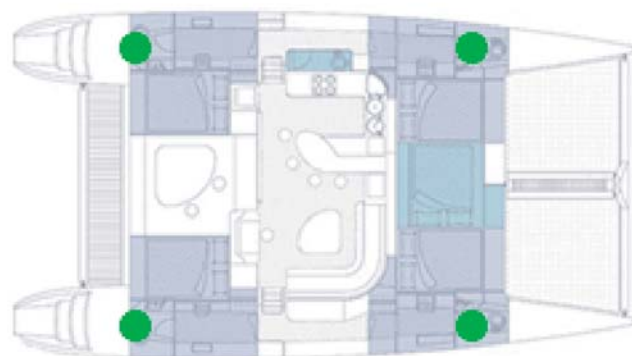
Sonihull Mono Positioning



Sonihull Duo Positioning



Sonihull Duo Positioning



Two Sonihull Duo Systems
Use - one for each Hull

Positions shown for illustration and guidance only,
Note: Actual mouting is on inside of Boat Hull



WATERLINE RECOMMENDATIONS

SONIHULL

Waterline Length to Ultrasonic System Recommendations



For Vessels in excess of the sizes shown please contact your management team for recommendations

10 metres - 32 ft. Mono

10 metres - 17 metres. Duo

15 metres - 20 metres. Duo + Mono

18 metres - 22 metres. Duo + Duo

Note: Twin hull vessels will require the above recommendations to be doubled



SONIHULL

Ultrasonic Antifouling System

SONIHULL MONO

Ultrasonic generator system
Single transducer suitable for both
sailing and motor



SONIHULL DUO

Dual output ultrasonic generator system
with two transducers, suitable for motor and
sailing yachts

Twin hull vessels will require the above
recommendations to be doubled

Catamarans requires two Sonihull Duo Units.





SONIHULL

TECHNICAL SPECIFICATION

- Power Supply Approvals: UL and CE
- Voltage: 100 - 240vAC 50/60Hz
12 - 24v DC
- Power: SoniHull Mono: 23 Watts
SoniHull Duo: 30 Watts
- Ultrasonic Generator
- Pulse Frequency: 20kHz - 200kHz
- Control Box Rating: IP65
- Transducer Rating: IP68
- Transducer Cable Length: 6 metres
- Weight: 3 Kg.
- Dimensions: 175mm x 130mm x 75mm
- Warranty: 1 year

INSTALLATION GUIDE

Mounting of Control Box

- Find suitable dry location above water line with suitable access to either Mains or Battery Power.
- Remove lid to expose mounting screw holes

Mounting Transducers

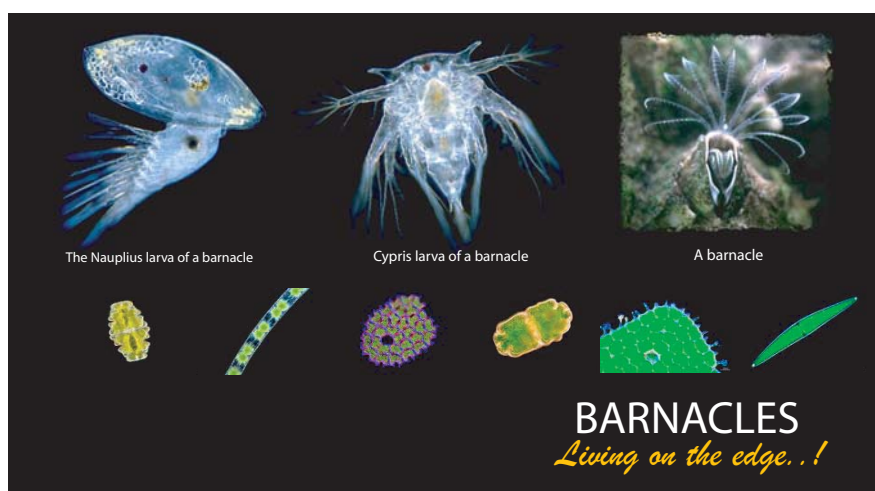
- Mount as close to centre line as possible.
- Use Sand Paper to prepare the surface. The surface needs to be flat and smooth to ensure best transmission quality.
- Use epoxy glue to bond the transducer mounting ring to the Hull. Ensuring that no excess epoxy enters the thread.
- To protect the thread of the mounting ring, we recommended applying a thin layer of vaseline to the thread prior to glueing.
- Allow the epoxy to set before attempting to attache the transducer.
- Before attaching the transducer to the mounting ring apply 2-3mm layer of a Silicone grease to the face of the transducer to allow better transmission of the Ultrasonic Signals to the Hull.
- Plug in the transducers to the control box before applying power.

• ENVIRONMENTALLY FRIENDLY



- INCREASE FUEL EFFICIENCY
- COST EFFECTIVE
- EASY TO INSTALL
- NO HULL PENETRATIONS REQUIRED
- AUTO LOW VOLTAGE CUT OFF AT 11 VOLTS TO PROTECT AGAINST BATTERY DISCHARGE

Effective Removal of a WIDE RANGE of ALGAE



**Don't
Let your Boat
END UP
like this . . .**



SONIHULL

Solar Charger Controller

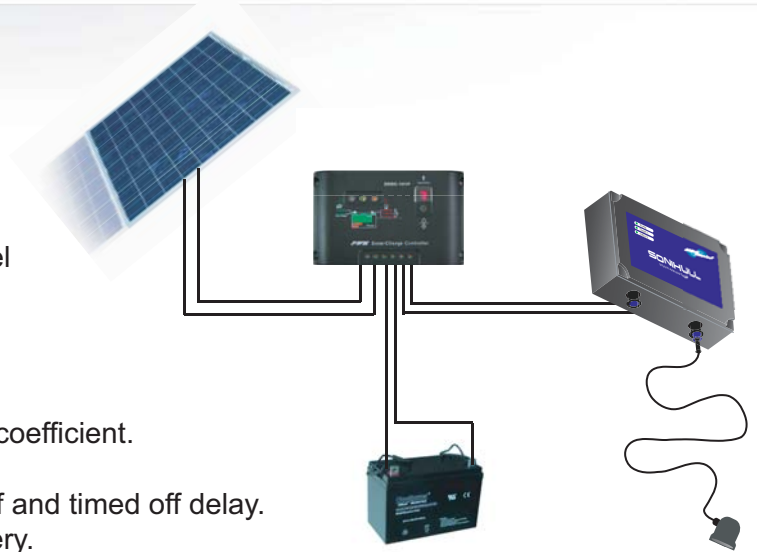
Reduce your “carbon paddle print” with the ultimate environmentally friendly Anti-foul solution.

Sonihull Solar controller.

NRG - PWM Solar controller is ideal for the boats on swing moorings or births without shore power.

Controls the distribution of power from the solar panel (not provided) to the the sonihull unit and to trickle charge the standby battery.

Features: Intelligent processor control
temperature compensation for the ultimate charging coefficient.
LED display with charging / battery status indication.
Manual override with digital status indication ON / Off and timed off delay.
Low voltage cutoff to prevent deep discharge of battery.



Great value for money: at last an environmental solution that does not cost the earth!

Recommendations

For Mono we recommend minimum 60 watt Solar panel and minimum standby battery: cold climates 80Ah, Tropical climates 24ah.
For Duo we recommend minimum 100 watt solar panel and minimum standby battery: cold climates 100Ah, Tropical climates 36ah.



OCEONIC

Sea Chest Protection System

Protects inlets, fillers, valve seats and associated pipe work



OCEONIC

Sea Chest Protection System



Trinity 50 metres yacht



Oceonic Sea Chest protection System
Protects inlets, filters, valve seats and associated pipe work



Larger Commercial Vessels



Multiple transducers installed in the hull and raw water inlets. The transfer rate of the ultrasonic signal is much higher on steel than fibreglass and therefore most effective.

On commercial ships each transducer should be calculated to a 3-5 metre radius on steel hulls to obtain ultimate results

Banish the Barnacle
with *Sonihull!*



NRG MARINE LTD.

United Kingdom
Tel.: +44 (0)845 900 2171
Fax.: +44 (0)845 900 2197
E-mail: info@nrgmarine.com
Website: www.nrgmarine.com

NRG SOLUTIONS TRADING FZE

United Arab Emirates
Tel.: +971 (0)7 2077 796
Fax: +971 (0)4 4414 382
E-mail: info@nrgmarine.com
Website: www.nrgmarine.com

Dealers required in all region. Please E-mail us at dom@nrgmarine.com
Dealer Shops available in all regions.