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# INSTALLATION AND OPERATION MANUAL

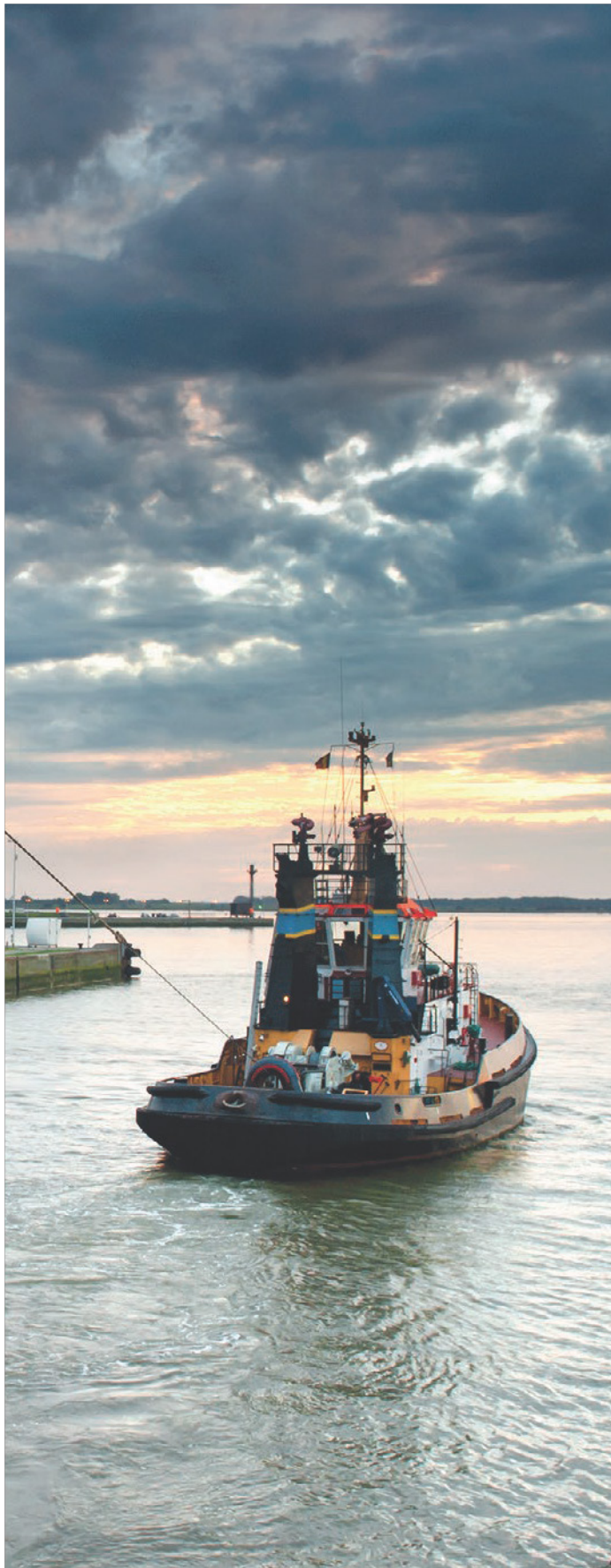
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**SONIHULL**  
ULTRASONIC ANTI-FOULING SYSTEM





## Welcome to Sonihull

Thank you for choosing the Sonihull ultrasonic anti-fouling system to protect your vessel from bio-fouling like algae, weeds and molluscs.

In this manual we will guide you through the best practices for fitting your Sonihull system. Please read the printed fitting instructions before you start your installation.

For further guidance, you can download the Sonihull app on your tablet or smartphone (Android and iOS devices supported).

In the Sonihull app you will find fitting guides for all the items you can protect from marine bio-fouling. Everything from hulls, box coolers and seachests to propellers, waterjets and pipework.

Alternatively, you can contact your local Sonihull supplier, or contact us direct at [info@sonihull.com](mailto:info@sonihull.com).

### Sonihull – the Smart anti-fouling choice

Sonihull is suitable for use on all materials that transmit ultrasound well, including: steel, aluminium, stainless-steel, titanium, FRP & GRP composites, and rigid plastic constructions.

**IMPORTANT** – If your vessel is made from FRP or GRP Sandwich Construction (two rigid composite surfaces separated by a foam core) fitting the transducers will involve cutting through the inner skin and removing some core material in order to get access to the dry side of the outer **SKIN IN DOUBT, CONTACT A PROFESSIONAL MARINE TECHNICIAN.**

## SAFETY INSTRUCTIONS

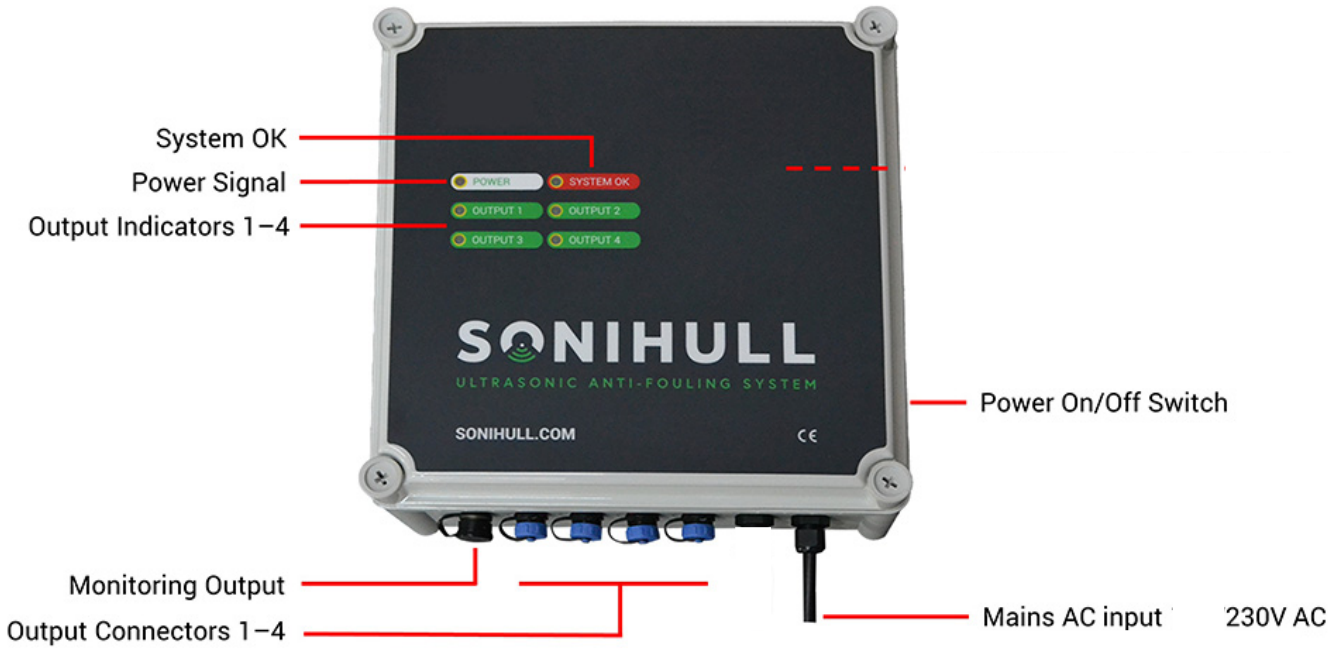
**DANGER** – Carefully read and follow all safety precaution and warnings before attempting to install and use this control box. We recommend that the electrical installation of this system is carried out by a qualified Marine Electrician. When mounting the control box, please find a suitable dry location. Connect all AC connections in accordance with all the relevant Wiring Regulation. If the product is damaged or missing parts, please do not install to run. Always disconnect the system from the power supply before performing any maintenance or inspections. Periodically inspect the transducer, cables, and control box for wear or damage. Replace components as necessary. Do not attempt to open or modify the control box or transducer. Replace damaged power cords immediately with parts approved by the manufacturer or a qualified technician in order to avoid a hazard. Unauthorized alterations or maintenance may compromise safety and void the warranty. In case of a system malfunction, immediately disconnect the power supply and contact Sonihull's technical support team for assistance. Ensure children are supervised and do not tamper with or play with the system. It is an industrial grade, also it is intended to be used by laymen in shops, in light industry, and on farms.

**This system is not to be operated by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless under proper supervision or instruction.**

**Mains power cable colour codes:**

Brown = Live      Blue = Neutral Green & Yellow = Earth

**IF IN DOUBT, CONTACT SONIHULL TECHNICIAN**



LED	COLOUR	NORMAL STATUS	FAULT STATUS	COMMENTS
Power On	Red	ON	Flashing	Flashing is normally due to incorrectly seated transducers.
Outputs 1-4	Green	ON	OFF	OFF when not connected or in fault.
System OK	Green	ON	OFF	Fault indication, check power & transducers.



## COMPONENTS INCLUDED

### Sonihull 4

- Sonihull ultrasonic Control Box with 4 outputs
- 4 x Ultrasonic Transducers each with 7.5m of cable and transducer mounting rings
- Mains cable with standard UK 3-pin fused plug
- Marine grade epoxy for bonding transducer mounting rings to surfaces
- Transducer gel



## TECHNICAL SPECIFICATIONS

### Sonihull 4

Power Supply Approvals	UL and CE
Voltage	230V AC 50/60Hz (100mA)
Avg. Power Consumption	18 Watts AC
Supply Breaker	10 Amps
Ultrasonic Frequencies	19.5 kHz – 55 kHz
Control Box IP Rating	IP65
Transducer IP Rating	IP68
Transducer Cable Length	7.5m (extendable up to 30m)
Weight	Control Box 3.5kg, Transducers 4.8kg, Total Boxed 13kg
Control Box Dimensions	280 x 280 x 130mm (W x H x D) 95
Mounting Ring Dimensions	x 24mm (Ø x H)
Transducer Dimensions	76 x 75mm (Ø x H)



**Humidity Preconditioning** 40°C at 96% RH  
**Maximum Operating Temp** 40°C (104°F)

**Altitude Rating**  
**94/9/EC ATEX Certified**

Precautions must be taken for systems that are to be installed at an altitude of over 2000m. Transducers compliant for use in Zone 0. Control Box compliant for use in Zones 1&2, if fitted in a separate cabinet.

### Warranty

Warranted for 12 months from the date of purchase against manufacturer defects. with an additional 12 months once you have registered your purchase online. (Please scan this QR Code or refer to the enclosed warranty card)





## SYSTEM INSTALLATION

### *Job order for typical installation:*

1. Plan the layout of your system and your cable runs
2. Ensure you have sufficient room for transducer and control unit installation
3. Prepare the surface where your transducers are going to be mounted
4. Bond the Transducer Mounting Rings in place (Follow the guides on following pages and allow enough time for the epoxy to cure fully)
5. Mount the Control Box and attach the AC supplies
6. Screw the transducers into the Transducer Mounting Rings
7. Run cables back to the control box (leaving enough slack for future transducer inspection)
8. Plug the transducer cables into the control box outputs and switch the system on

## Control Box Location

Once installed your Sonihull system requires very little maintenance, so the control box can be fitted out of sight in a suitable cabinet.

Find a suitable dry and clean location with access to AC power supplies. Please also consider access and routing for the transducer cables and space for connecting the cable connectors to the control box.

To mount the control box, carefully remove the lid to expose the four mounting holes and screw/bolt into place. Replace the lid and connect the unit to the AC supplies. **Please consult a qualified marine electrician to carry out the electrical installation.**

Once installed the control box should be periodically checked to ensure that it is powered and working correctly.

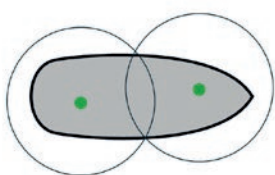


## Tranducer Location - HULLS

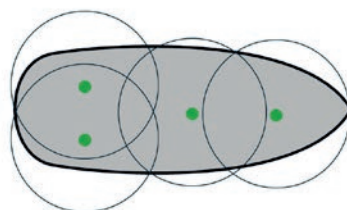
When using Sonihull to protect hulls from bio-fouling, it is important to consider the size of the wetted area at rest and the optimum transducer spacing. Below are some suggested transducer locations for workboat hulls. The number and spacing of your transducers will depend on a number of factors. The hull material, joins, welds, the presence of stringers and stiffeners, etc.

As a general rule, in most steel or aluminium hulls, each transducer will protect a circular area with a diameter of about 6-7m. The protective process relies on the transmission of ultrasound through to the surface of the hull that is in contact with the water. Refer to the diagrams below before you plan your installation and ensure that you consider 'breaks' in transmission for items like stern gear and propulsion systems.

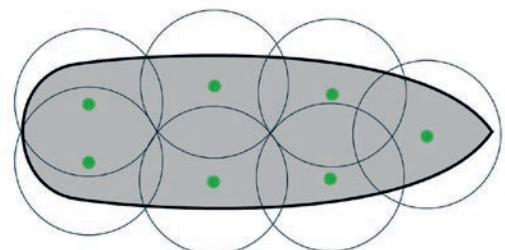
### Workboat Hulls



Up to 50ft. (15 metres)



50-70ft. (15-21 metres)



60-100ft. (18-30 metres)

## Transducer Location – STORAGE TANKS

For large potable water storage, Sonihull can be used to keep water fresher for longer. Sonihull systems can also be used to protect fuel tanks against Diesel bug.

Look to fit transducers in the middle of the tank sides, avoiding voids, air gaps and weld seams.

## Transducer Location – KEEL COOLERS

Underwater heat-exchangers are prone to heavy bio-fouling by weeds, barnacles and mussels. This fouling impedes water flow and reduces the effectiveness of the cooling system, putting extra strain on your main engines and adding to maintenance costs.

For Sonihull to provide effective anti-fouling protection in Keel Coolers two areas should be considered. The hull and the keel cooler itself.

The recessed hull surface in which the keel cooler is located should be protected from the dry side of the hull as described in the hull section. The keel cooler itself can be protected by using Sonihull Keel Cooler Adaptors.

These patented adaptors create a strong physical contact between a Sonihull transducer and the keel cooler's pipe fittings inside the hull. There's no need for any plumbing or cooling system drainage. A split collar (smooth or threaded) clamps snugly around the inlet and outlet pipes.

Most keel coolers in commercial vessels will be very well protected by one transducer on each of the inlet and outlet pipes and enough transducers to cover the recessed hull area behind the cooler elements.

Keep the total number of transducers in mind when you are planning the whole anti-fouling system for your box cooler, propeller, sea chests etc... This will help you select the correct control box(es) or provide enough transducer connection outlets.

**Before**



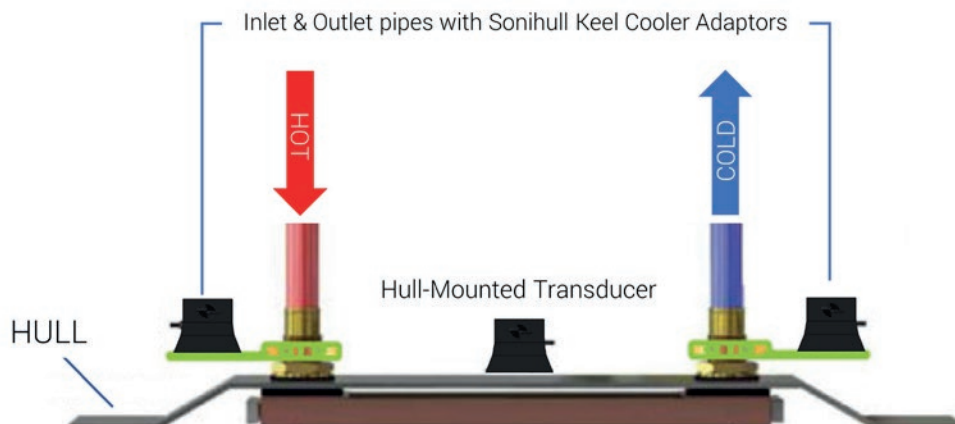
**After**



### Typical Results in Keel Coolers

**Before** - 12 months of normal operation with existing anti-fouling systems and regimes

**After** - 12 months of normal operation after cleaning & fitting Sonihull system



**Typical Layout Protecting a Keel Cooler**





## Transducer Location – BOX COOLERS

Most box coolers can be protected from bio-fouling by two or more Sonihull transducers.

One transducer should be mounted directly to the top plate of the box cooler, preferably close to the coolant inlet. Avoid any welded seams.

On smaller box coolers, there may not be enough room to locate a transducer on the top plate. In these cases, consider fitting the transducer to the coolant inlet pipe with a Sonihull Pipe Adaptor.

The second transducer should be mounted as close to the box cooler coils as possible – consider the dry side of transverse and longitudinal walls of the seachest to determine the location that offers the best coverage.



**Above** - Typical box cooler setup  
**Below** - External view of seachest

## Transducer Location – SEACHESTS

For Seachests without box coolers, transducers should be mounted on the dry side of the vertical sides of the sea chest. Avoid any stiffeners or welded seams and try to position the transducers in the middle of the seachest walls. [Do not mount transducers on the horizontal top of the seachest if there is any chance of an airgap, or if an air bleed valve is fitted.]



## Transducer Location – PROPELLERS

To protect commercial vessel propellers, you should refer to your vessel's General Arrangement drawings and determine the best transducer locations for good transmission of ultrasound to the prop shaft and to the propeller.

The photo opposite is from a VLCC with a single 10m diameter propeller mounted to a 1m prop shaft. A total of twelve Sonihull Transducers are used. Eight are installed on the Stern Tube Flange (shown opposite) with four more fitted on the Intermediate Bearing.



**Above** - Propeller installation on VLCC  
**Below** - Diagram showing mounting locations for waterjets

## Transducer Location – WATERJETS

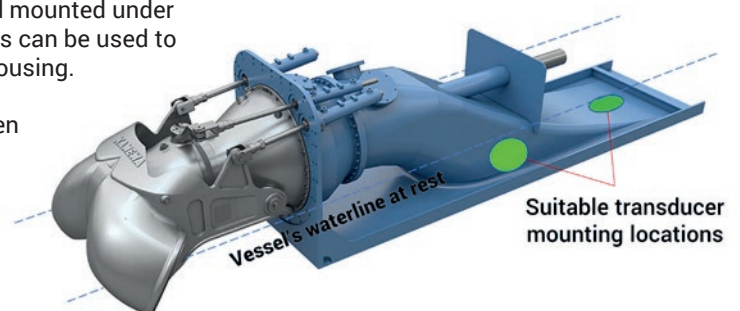
Fouling in water jets has a very detrimental impact on jet performance and vessel speed. Even very light bio-fouling can reduce top speed by about 20% and create a corresponding spike in fuel consumption.

Sonihull can keep a clean waterjet fouling-free using the power of ultrasound. The number of transducers required, depends on the size of the water jet.

For jets with large impellers (superyachts, patrol vessels and fast ferries) you may need to use two or three transducers.

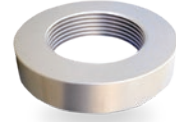
Transducers should be mounted to the dry side of the water jet and mounted under the waterline of the vessel at rest. If required Sonihull Pipe Adaptors can be used to mount transducers to suitable uniform curved surfaces in the jet housing.

Be sure to consider how many transducers you will need in total when protecting your, keel coolers, box coolers, etc. This will help you select the correct number of control boxes and provide sufficient transducer channels.

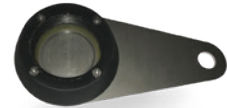


## TRANSDUCER MOUNTING ACCESSORIES

**ALUMINIUM MOUNTING RING** - These marine-grade weldable aluminium mounting rings are ideal for larger aluminium hulls, jet drives, sea chests or other aluminium structures. The rings can be fitted as part of the standard build where Sonihull systems are offered as a buyer option.



**OFFSET (IPS) ADAPTOR** - This bolt-on device allows ultrasonic transmission into surfaces that are hard to reach or acoustically isolated. The Offset (IPS) Adaptor is ideal for smaller applications where fitting access may be an issue.

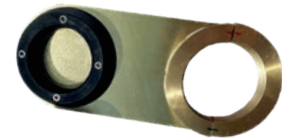


This simple solution allows you to offset a transducer wherever you can get a bolt-down metal-to-metal contact on the inboard part of item being protected from bio-fouling.

**PIPE ADAPTOR** - With our full range of standard-diameter pipe adaptors, Sonihull can be attached to almost any kind of pipework. Protecting valves, inlets, ballast transfer systems or other raw water handling equipment from being clogged by unwanted marine bio-fouling.



**KEEL COOLER ADAPTOR** - These patented adaptors create a strong physical contact between a Sonihull transducer and the keel cooler's pipe fittings inside the hull. There's no need for any plumbing or cooling system drainage. A split collar (smooth or threaded) clamps snugly around the inlet and outlet pipes.





# SONIHULL

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SAVING THE OCEANS, ONE VESSEL AT A TIME.

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