INSTALLATION AND OPERATION MANUAL

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

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BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

SYSTEM STATUS INDICATOR

NORMAL OPERATION

STATUS 1: SOLID GREEN

Status

Monitors CH1
LED is solid green during the normal operation

FAULT DETECTED

STATUS 1: FLASHING RED

Fault on channel - LED will flash red on the affected channel

NO POWER RECEIVED

STATUS 1: NO LIGHT

LED being off indicates low voltage or no power supply is detected by the system

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

COMPONENTS INCLUDED

1 x BPS-1 Controller
2 x BPS Marine Transducers
1 x Pack of JB MarineWeld

TECHNICAL SPECIFICATIONS

BPS-1

Power Supply Approvals	UL and CE
Voltage	12V DC
Avg. Power Consumption	0.25Ah
DC Supply Breaker	5A
Ultrasonic Frequencies	19.5 - 55 kHz
Control Box IP Rating	IP68
Connection IP Rating	IP67
Transducer Cable Length	15FT Per Transducer
Weight	0.5 kg (1.10lbs)
Control Box Dimensions	127 H x 51 W x 51 D (mm)
Transducer Dimensions	59 H x 73 D (mm)

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ULTRASONIC ANTIFOULING TECHNOLOGY

SYSTEM STATUS INDICATOR

NORMAL OPERATION

STATUS 1: FLASHING GREEN

POWER

Monitors CH1-2
LED is flashing green during the normal operation

FAULT DETECTED

STATUS 1: FLASHING RED

Fault on channel - LED will flash red on the affected channel

NO POWER RECEIVED

STATUS 1: NO LIGHT

LED being off indicates low voltage or no power supply is detected by the system

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

COMPONENTS INCLUDED

1 x BPS-2 Controller
4 x BPS Marine Transducers
1 x Pack of JB MarineWeld

TECHNICAL SPECIFICATIONS

BPS-2

Power Supply Approvals	UL and CE
Voltage	12V DC
Avg. Power Consumption	0.50Ah
DC Supply Breaker	5A
Ultrasonic Frequencies	19.5 - 55 kHz
Control Box IP Rating	IP68
Connection IP Rating	IP67
Transducer Cable Length	15FT Per Transducer
Weight	1.09 kg (2.40lbs)
Control Box Dimensions	140 H x 104 W x 61 D (mm)
Transducer Dimensions	59 H x 73 D (mm)

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

SYSTEM STATUS INDICATOR

NORMAL OPERATION

STATUS 1: FLASHING GREEN

POWER

Monitors CH1-4
LED is flashing green during the normal operation

FAULT DETECTED

STATUS 1: FLASHING RED

Fault on channel - LED will flash red on the affected channel

NO POWER RECEIVED

STATUS 1: NO LIGHT

LED being off indicates low voltage or no power supply is detected by the system

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

COMPONENTS INCLUDED

1 x BPS-4 Controller
4 x BPS Marine Transducers
2 x BPS 15FT Extension Cables
1 x Pack of JB MarineWeld

TECHNICAL SPECIFICATIONS

BPS-4

Power Supply Approvals	UL and CE
Voltage	24V DC
Avg. Power Consumption	1.00Ah
DC Supply Breaker	5A
Ultrasonic Frequencies	19.5 - 55 kHz
Control Box IP Rating	IP68
Connection IP Rating	IP67
Transducer Cable Length	15 FT Per Transducer
Weight	2.27 kg (5.00lbs)
Control Box Dimensions	140 H x 104 W x 61 D (mm)
Transducer Dimensions	59 H x 73 D (mm)

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

SYSTEM STATUS INDICATOR

NORMAL OPERATION

STATUS 1: FLASHING GREEN

POWER — Monitors CH1-4
LED is flashing green during the normal operation

POWER — Monitors CH5-6
LED is flashing green during the normal operation

FAULT DETECTED

STATUS 1: FLASHING RED

Fault on channel - LED will flash red on the affected channel

NO POWER RECEIVED

STATUS 1: NO LIGHT

LED being off indicates low voltage or no power supply is detected by the system

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

COMPONENTS INCLUDED

1 x BPS-6 Controller
6 x BPS Marine Transducers
3 x BPS 15FT Extension Cables
2 x Packs of JB MarineWeld

TECHNICAL SPECIFICATIONS

BPS-6

Power Supply Approvals	UL and CE
Voltage	12V DC
Avg. Power Consumption	1.50Ah
DC Supply Breaker	5A
Ultrasonic Frequencies	19.5 - 55 kHz
Control Box IP Rating	IP68
Connection IP Rating	IP67
Transducer Cable Length	15 FT Per Transducer
Weight	3.18 kg (7.00lbs)
Control Box Dimensions	179 H x 230 W x 133 D (mm)
Transducer Dimensions	59 H x 73 D (mm)

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

SYSTEM STATUS INDICATOR

NORMAL OPERATION

STATUS 1: FLASHING GREEN

POWER — Monitors CH1-4
LED is solid green during the normal operation

POWER — Monitors CH5-8
LED is solid green during the normal operation

FAULT DETECTED

STATUS 1: FLASHING RED

Fault on channel - LED will flash red on the affected channel

NO POWER RECEIVED

STATUS 1: NO LIGHT

LED being off indicates low voltage or no power supply is detected by the system

BPS MARINE™

ULTRASONIC ANTIFOULING TECHNOLOGY

COMPONENTS INCLUDED

1 x BPS-8 Controller
8 x BPS Marine Transducers
4 x BPS 15FT Extension Cables
2 x Packs of JB MarineWeld

TECHNICAL SPECIFICATIONS

BPS-8

Power Supply Approvals	UL and CE
Voltage	12V DC
Avg. Power Consumption	2.00Ah
DC Supply Breaker	5A
Ultrasonic Frequencies	19.5 - 55 kHz
Control Box IP Rating	IP68
Connection IP Rating	IP67
Transducer Cable Length	15 FT Per Transducer
Weight	3.99 kg (8.80lbs)
Control Box Dimensions	179 H x 230 W x 133 D (mm)
Transducer Dimensions	59 H x 73 D (mm)

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ULTRASONIC ANTIFOULING TECHNOLOGY

SYSTEM INSTALLATION

Job order for typical installation:

Phase 1: Preparation & Layout

- Step 1: Map the Installation – Plan the physical layout of the system, including the exact placement of the control box and the most efficient paths for all cable runs.
- Step 2: Surface Prep – Thoroughly clean and prepare the specific mounting areas where the transducers will be attached to ensure a strong bond.

Phase 3: Mounting & Curing

- Step 3: Secure the Transducers – Bond the transducers to the prepared surfaces using provided epoxy. Follow the detailed application guides provided and allow the epoxy to cure completely before proceeding.
- Step 4: Install the Control Unit – Securely mount the control box in its designated location and connect it to the DC power source.

Phase 3: Wiring & Activation

- Step 5: Cable Routing – Route the transducer cables back to the control box. Ensure you leave a small amount of slack at the ends to allow for future maintenance or inspections.
- Step 6: Final Connection – Plug the transducer cables into the appropriate control box outputs and power the system on to verify operation.

Transducer Placement: Hull Guidelines

To effectively protect your hull from biofouling using BPS Marine systems, placement must be calculated based on the total wetted surface area and optimal transducer spacing.

Key Planning Factors

The effectiveness of the ultrasound signal depends on how well it can travel through your specific hull.

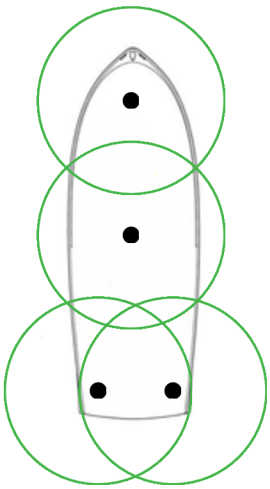
Before installation, evaluate the following:

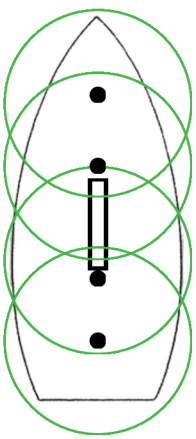
- Hull Construction: Material (metal, fiberglass,carbon fiber), weld points, and joints.
- Internal Structure: The presence of stringers, ribs, or stiffeners that may dampen the signal.
- Transmission Breaks: Identify "dead zones" caused by stern gear or propulsion systems that might block the ultrasonic path.

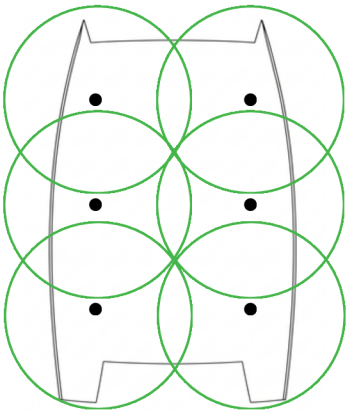
General Coverage Rules

- Effective Range: On most hulls, a single transducer typically protects a circular area with a 200sqft diameter.
- Mechanism: The system relies on the efficient transmission of ultrasound through the hull material directly to the external surface in contact with the water.

Note: The diagrams provided in this manual are for reference only. Your specific layout will vary based on the unique geometry and internal bracing of your vessel.







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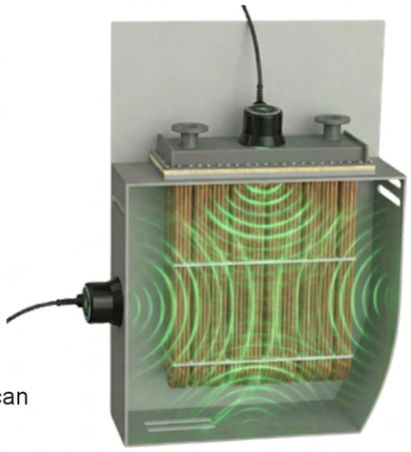
ULTRASONIC ANTIFOULING TECHNOLOGY

Box Cooler & Sea Chest Protection Strategy



For effective biofouling prevention, box coolers typically require a multi-transducer setup (two or more units). This ensures the ultrasonic signal saturates both the high-temperature "hot spots" and the surrounding enclosure.

1. Primary Placement: The Coolant Inlet

The first transducer should target the "hot" side of the system where biofouling is most aggressive.

- Optimal Location: Mount directly to the top plate of the box cooler, as close to the coolant inlet as possible.
- Installation Note: Avoid mounting directly over or near welded seams, as these structural breaks can dampen the ultrasonic signal.
- Small Unit Alternative: If the top plate has insufficient space, secure the transducer to the coolant inlet pipe using a BPS Pipe Adaptor.

2. Secondary Placement: Coil & Enclosure Coverage

The second transducer is designed to protect the cooler coils and the internal sea chest surfaces.

- Optimal Location: Position this unit on the dry side of either the transverse or longitudinal walls of the sea chest.
- Strategic Aim: Choose a mounting point that offers the most direct "line of sight" to the box cooler coils. This ensures maximum ultrasonic saturation across the cooling surfaces.

Mounting to Steel & Aluminum Surfaces

The overall performance of the BPS system is directly linked to the quality of the transducer installation. To ensure maximum ultrasonic transmission, you must bond the transducers to a surface that is flat, smooth, and clean.

SOLID STEEL OR ALUMINIUM SURFACE

Surface Mounting Restrictions

To prevent signal loss or bond failure, do not install transducers in the following areas:

- **Structural Obstructions:** Stay at least 6in away from any bulkheads, ribs, or stiffeners.
- **Weld Zones:** Avoid mounting directly onto weld seams or areas with visible weld spatter.
- **Irregular Geometry:** Do not attempt to mount on concave or convex (curved) surfaces.
- **Poor Surface Condition:** Never bond to surfaces that are rough, oxidized, or rusty.

INCORRECT INSTALLATIONS

Tilted On Surface

Uneven Surface

Cracked Surface

Dirty Surface

Corroded/Rusted Surface

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Mounting to GRP & FRP Surfaces

The efficiency of the BPS system depends entirely on how well the ultrasound can travel through the hull. For GRP/FRP vessels, it is critical that the transducer is bonded to a solid, monolithic (single-layer) section of the hull that is flat, smooth, and clean.

Surface Mounting Restrictions

To prevent signal loss or poor adhesion, do not install transducers in the following areas:

- Structural Obstructions: Maintain a clearance of at least 6in from any bulkheads, stringers, or stiffeners, as these internal structures absorb ultrasonic energy.
- Cored or Sandwiched Sections: Do not mount to any part of the hull that contains a foam or balsa core. The transducer must be bonded to solid fiberglass; air or core material will block the signal entirely.
- Irregular Geometry: Avoid mounting on concave or convex surfaces; a perfectly flat contact point is required for a successful bond.
- Surface Defects: Do not install over delaminated fiberglass, air bubbles (voids), or areas with cracked gelcoat.
- Contaminated Surfaces: Never bond to surfaces with residual bilge oil, moisture, or loose paint.

INCORRECT INSTALLATIONS

Tilted On Stringer

Uneven Surface

Cracked Surface

Dirty Surface

Blistered Surface

CONTACT BPS MARINE FOR SUPPORT & INQUIRIES

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