THE WORLD'S
PREMIER
BIOFOULING
SYSTEM

ULTRAGUARD
Antifouling

Master Series

MS-02
OWNER'S MANUAL

WWW.ULTRAGUARD-ANTIFOULING.COM

ULTRAGUARD Antifouling

Master Series

Ultraguard Antifouling
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SYSTEM DETAILS

SPARE PARTS
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TECHNICAL ASSISTANCE
technical@ultraguard-antifouling.com

WELCOME

The International Maritime Organisation (IMO) consider biofouling as one of the main vectors for bio-invasions and is described as the undesirable accumulation of microorganisms, plants, algae and animals on submerged structures, especially on ships' hulls.

Biofouling isn't just a source of invasive species though. By causing excess drag on hulls it makes vessels less efficient causing an increase in greenhouse gas emissions. By blocking sea chests, seawater pipes and coolers it causes expensive damage to machinery. All of this is also very expensive to remove. It often requires the vessel to be dry-docked or divers to dive on the hull. We believe that prevention is better than cure.

Traditionally, biocides such as copper have been used to protect the vessel from marine growth and prevent biofouling. However, these biocides are environmentally damaging to the marine eco system and governments around the world are now making moves to stop their use.

Ultraguard Antifouling offers vessel owners and operators a system that keeps biofouling at bay but doesn't have any of the adverse ecological effects that biocidal system have.

"With an install base of 11 vessels, SEACOR Marine is a long time user of the ULTRAGUARD MGPS Anti-fouling systems, keeping their hulls clean and efficient."

MANAGER OF ENGINEERING -PROJECTS

TECHNICAL SPECIFICATIONS

- **CONTROL UNIT DIMENSIONS:** L = 260mm x H = 200 (including brackets) x D = 52mm
- **CONTROL UNIT WEIGHT** 1600g
- **POWER CABLE LENGTH:** 1250mm
- **TRANSDUCER DIMENSIONS:** Ø = 90mm x H = 105mm
- **TRANSDUCER WEIGHT:** 1450g
- **TRANSDUCER EXTENSION CABLE LENGTH:** 10m
- **CONTROL UNIT CURRENT DRAW (TWO TRANSDUCERS ATTACHED):**

  @12v DC – Pulsing = 11 Amps Average = 1.1 Amps

  @24v DC – Pulsing = 6 Amps Average = 0.55 Amps

- **AVERAGE POWER CONSUMPTION (TWO TRANSDUCERS OPERATING):** 13.2 Watts
- **TRANSDUCER RATING:** 120w
- **FREQUENCY RANGE:** 18kHz – 42kHz
- **CONTROL SYSTEM:** Fully digital microprocessor controlled signal generator and amplifier circuits
- **PLACE OF MANUFACTURE:** Fife, Scotland, United Kingdom

Installation, maintenance and repairs of Ultraguard Antifouling systems should ONLY be carried out by competent personnel who are familiar with marine electrical systems!

There is a risk of severe injury or death when working in the vicinity of live electrical equipment. ALWAYS ensure proper isolation and safety lock out procedures are followed!

INSTALLATION INSTRUCTIONS

BONDING THE TRANSDUCERS

CLEAN AND PREPARE BOTH THE TRANSDUCER FACE AND THE SURFACE BEING BONDED TO

1. Mark the location the transducer is to be bonded to.
2. Clean area with Loctite SF 7063, Brake Cleaner or Acetone to remove any oils, grease etc.
3. Wash surrounding area (around 50mm extra radius of Location and whole face of Transducer) with fresh water (preferably de-ionised/distilled water) to remove salts.
4. Abrade area to be bonded down to clean metal. (Transducer face will only need light removal of oxidation).
5. Re-degrease with Loctite SF 7063, Brake Cleaner or Acetone until, “Surgically,” clean.
6. Clean with fresh water washing to a smaller diameter than the original zone to ensure contamination from surrounding areas are not washed on to the cleaned surface.
7. Repeat No 6, (preferably de-ionized/de-mineralised water for maximum cleanliness).
8. Immediately apply Loctite SF 7515 to the metal surface, allow to react for 1 minute or so, wipe/dab off excess 7515 with clean cloth. Allow to fully dry
9. Carry out bonding process
10. After fixturing, apply at least a 5mm thick band of Loctite SI 5900 to seal the area from the bottom of the transducer sides to protect against future corrosion and contamination.
11. Allow adhesive bonds to cure for 24 hours before operating transducers

If your vessel’s hull has a sandwich laminate construction with a foam, plywood or honeycomb core between an inner and outer skin of GRP/Carbon fibre/ Kevlar, then a disk slightly larger than the transducer head will need to be cut out of the inner skin and the sandwich core. This cut-out should then be filled with solid resin/fibre laminates ensuring that there are no air gaps created to build a base for the transducer that allows the transducer to transmit the acoustic waves directly to the outer shell of the hull.

If the inner surface of your hull has a rough GRP finish that can’t be sanded smooth it may be necessary to apply a skim of resin to the transducer locations before fitting the transducers. This is done to avoid air gaps between the transducer head and the hull. This is extremely important as air gaps that are subjected to powerful ultrasonic waves can cause erosion of the surface.

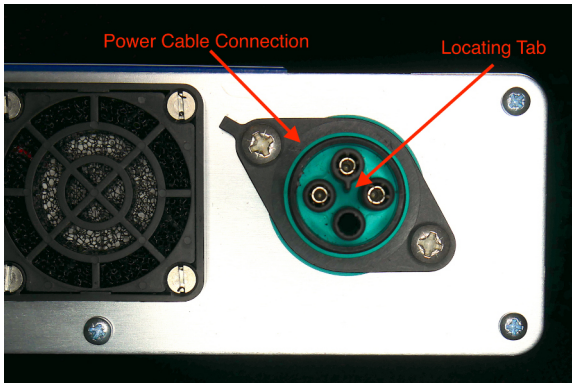
INSTALLATION INSTRUCTIONS

FITTING THE CONTROL UNITS

Locate a suitable location for the Ultraguard Master Series control unit. It should be a dry area, inside and protected from the elements. Ultraguard recommends that you fit the control unit as close as possible to your power source in an area which is easily accessible. The control unit has four adjustable mounting brackets. Simply attach the unit to a secure bulkhead or panel using fixings (Not Supplied) through the slots on the brackets.

The Ultraguard Master Series control unit can run on either a 12v DC or 24v DC power supply. There are two power cables included in your kit, one for 12v DC and the other for 24v DC. Simply choose the correct cable for your supply voltage and connect it to the power cable connection on the control unit.

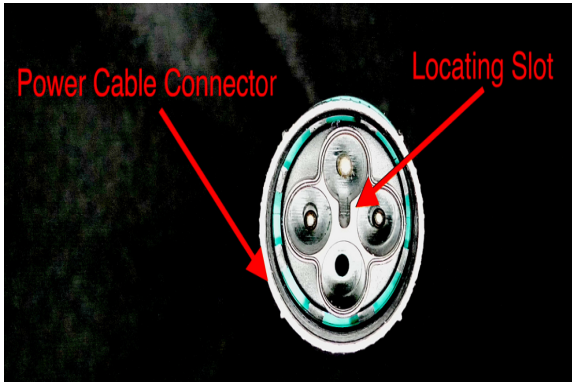
This connector can only fit together one way. Line up the locating tab with its corresponding slot.



DOUBLE CHECK YOU HAVE THE CORRECT CABLE; THEY ARE NOT INTERCHANGEABLE!

Push the cable end connector and control unit connection socket together and screw up hand tight.

The power cable ends have been left unterminated to allow each customer to terminate in the best manner for their vessel. We recommend using crimp-on connectors of suitable amperage rating (See technical specification page) that best connects to your onboard power supply. Non insulated crimp-on connectors should be insulated with heat shrink tubing after fitting to the cable ends.



INSTALLATION INSTRUCTIONS

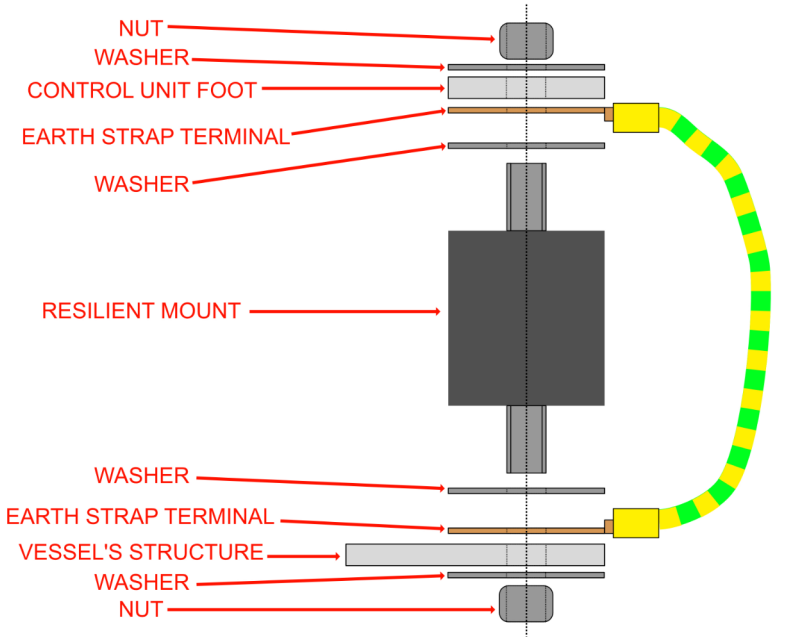
EARTH BONDING THE CONTROL UNIT

On some vessels, it may be beneficial to mount Master Series control units on rubber resilient mounts. This will offer a level of isolation against any vibration or juddering that the vessel may experience due to machinery or inclement weather. If this is the case then the Master Series control unit casing should be bonded to the vessel's structure with an Earth Wire/Strap.

This form of earth bonding is purely a safety measure in the event of a fault occurring inside the casing which may lead to the casing becoming live. The system does not earth through the casing during normal operation.

The earth strap should be fitted across one of the resilient mounts to bond the casing to the vessel's structure.

Ultraguard recommends that the earth strap should be manufactured with a terminal ring or fork at each end to ensure the best possible contact whilst allowing a good mechanical fitment around the studs/ screws.



WARNING

The Ultraguard Master Series control unit contains electronic components that are sensitive to stray electrical currents from activities such as welding.

If there is to be electric arc welding (TIG, MIG, MMA) carried out on the vessel's structure, the Earth Bonding Straps should be disconnected from each control unit for the duration of the activities to isolate the systems from any stray currents generated.

If the systems are not mounted on resilient mounts then the entire control unit should be disconnected from the transducers and power supply and physically dismounted from the vessel and stored in an electrically isolated location until the welding work is complete.

SYSTEM OPERATION
STARTING AND FAULT FINDING

When switching on the control unit, it is normal for the Transducer Operation LEDs on the end plate of the control unit to remain blank for a few seconds whilst the control circuit initialises and pulse width modulation (PWM) begins. The LEDs should then turn GREEN and remain so throughout operation.

Blank LEDs during Initialisation

Two Green LEDs during Normal Operation

AMBER LEDs AT SWITCH ON

If the LEDs turn AMBER, check that the transducer cable is properly connected to the panel and that there is no damage to the cable.

BLANK LEDs AT SWITCH ON

If the LEDs do not illuminate and remain blank, check that power is properly applied to the panel and that the power switch is in correct position. If it is contact Ultraguard Antifouling for further assistance.

SYSTEM OPERATION
STARTING AND FAULT FINDING

RED LEDs AT SWITCH ON

There is a major PCB Fault. Contact Ultraguard technical support.

AMBER LED DURING OPERATION

There is a minor fault on the system. Switch off circuit. Check transducer cable is properly connected and that the cable is not damaged or broken along its length.

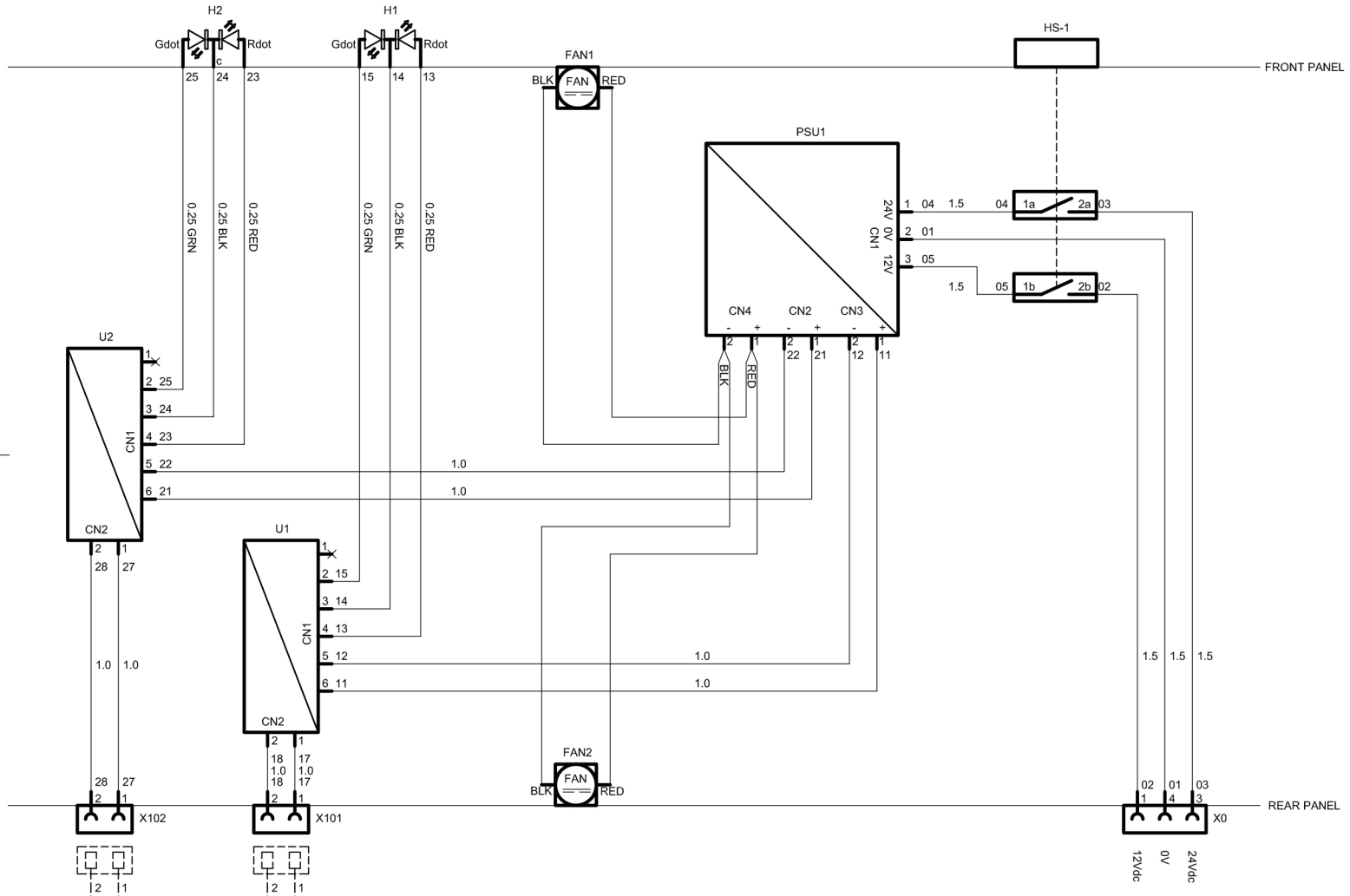
Switch circuit back on, fault should have cleared. If fault re-appears contact Ultraguard technical support.

RED LED DURING OPERATION

System has a major fault. Switch off circuit, wait 30 seconds and switch the circuit back on.

Fault should clear. If fault re-appears please contact Ultraguard technical support.

RevNo	Revision note	Date	Signature	Checked
1	DRAWING CREATED FOR M100/10608LF	24/03/21	PN	-



TITLE:
CIRCUIT – MGPS ULTRAGUARD UG02 12/24vdc

NOTES:
1) VIEW WITH KEY–TECH BOM M100/10608LF
2) IDENTIFY COMPONENTS WITH CIRCUT REFERENCE LABELS DURING ASSEMBLY
3) DO NOT FIT WIRE IDENTS TO WIRES FROM H1 AND H2

REFERENCE DOCUMENTS:
1) KEY–TECH BOM M100/10608LF
2) KEY–TECH ASSEMBLY DRAWING M100–10608LF–GA
3) KEY–TECH WIRING SCHEDULE M100–10608LF–WS

CROSS JOIN

Itemref	Quantity	Title/Name, designation, material, dimension etc	Article No./Reference

Designed by	Checked by	Approved by - date	File name	Date	Scale
PN	-	-	M100-10608LF-CD-R1.DWG	24/03/21	NTS

ULTRAGUARD Antifouling

CIRCUIT MGPS ULTRAGUARD DC UG02

M100-10608LF-CD	Edition	Sheet
	1	1/1

WARRANTY

We understand that operating vessels at sea can be a stressful activity, that's why all Ultraguard systems and components come with a two year warranty.

Wherever your vessel is in the world we will make sure you get the parts and service you require. We also offer technical support via email or phone so that you can communicate directly with our technical team to help you resolve any problems your experiencing with your Ultraguard system as quickly as possible.

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