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## MODEL 110S MONITORING STATION

### Installation and Operating Instructions

**!CAUTION! THIS MONITORING SYSTEM SHOULD ONLY BE USED TO MONITOR HULLS AND OTHER UNDERWATER STRUCTURES FABRICATED PRIMARILY FROM MARINE ALUMINUM ALLOYS.**

#### Installing the Monitor Meter

1. The corrosion monitor meter should be located in a highly visible location. It should not be located behind a door, inside a cupboard or anywhere else where it is hidden from view. The instrument may be installed near the helm area, either in the main cabin or on the bridge, so as to take advantage of existing wire runs.
2. If the unit is to be placed in a location exposed to the weather, such as on a flying bridge, it should be protected from the elements. It doesn't like being wet, or even damp.
3. The monitor meter may be flush mounted or box mounted. Flush mounting is generally more attractive. Flush mount by making a cutout 3" x 3 3/4" to allow for the internal components. Install the enclosure on the reverse side of the panel, if possible, to protect the electronic components.
4. Before mounting the monitor meter box, drill a hole through the side, back or bottom to allow for wire entry.
5. Be sure to leave enough excess wire at the monitor meter to allow for its removal from the panel should the unit require service or repair at some future time.

#### Installing the Reference Cell

1. The preferred location for the reference assembly is generally beneath the hull near the stern of the boat. Mounting the reference cell on the transom, even on a displacement hull, will result in inaccurate readings of the monitor meter when the boat is under way.
2. The reference cell must not be closer than twelve inches (12") to any sacrificial anode or closer than sixty inches (60") to any functioning impressed current anode.
3. **The reference electrode should never be painted.**
4. Drill a 1/2" hole through the boat's bottom at the location chosen for the reference cell. Remove the two stainless steel nuts, the stainless steel flat washer, 5/8" thick white Delrin washer and the plastic sleeve from the reference cell mounting stud. **Do not** disassemble the reference assembly further.
5. Cut the plastic sleeve to the thickness of the hull (slightly less than the hull thickness when installing in a wood hull).
6. Use a one part polysulfide rubber sealant (such as Boat Life) to bed the reference assembly. Make a donut of bedding compound around the reference assembly stud and

slide the plastic sleeve that has been cut to the proper length down the stud until it is against the green GRP shield.

7. Slide the reference assembly stud into the hole from the outside of the boat until the GRP shield is against the hull. With someone holding the assembly with a wrench on the outside, put the already bedded white Delrin washer over the stud and against the hull on the inside. Follow this with the stainless steel flat washer and one stainless nut. Tighten the nut to 12 foot pounds torque. Do not exceed 12 ft./lbs. torque. The second nut is to be used to hold the wire terminal for the meter connection in place.

### **Wiring and Connecting the Monitor System**

1. Green #14 AWG DC primary wire should be used to connect the reference cell to the monitor meter at the "G" terminal on the circuit board. Yellow #14 AWG wire of the same type should be used to connect the hull or bonding system to the monitor meter at the "Y" terminal. Where possible, the hookup wires should be routed through existing wire runs. In any case, they should be installed and secured in such a manner as to prevent physical damage to the wire.
2. Solder type terminations should be used at the wire ends. The terminations should be crimped, soldered and sealed with a high quality wire sealer. Be certain that the contact area on the hull is clean and free of any oily residue before fastening the wire termination to it. All contacts should be sealed with a high quality wire sealer after they have been tightened.
3. It is essential that the electrical resistance between all exposed metal parts of the hull be checked with an ohm meter. A resistance in excess of .1 ohm must be corrected with bonding. Rudders and propeller shafts will typically require bonding to maintain a low resistance electrical contact to the hull and its protective anodes. Propeller shafts 1.5" in diameter and smaller may be bonded with propeller shaft wiper assemblies. Shafts 1.75" in diameter and larger should be bonded with slip ring assemblies.

### **Operation and Interpretation of the Monitor Indications**

1. The green "SAFE" zone is the desirable reading under all operating conditions. In corrosion control terms, if the vessel is in the water it is operating, regardless of whether it is sitting still at its mooring or at cruising speed.
2. The red "UNDER" zone is a danger zone. A reading in this zone indicates insufficient cathodic protection. The further the indicator needle progresses into this zone the more rapid the expected corrosion attack. An indication in this zone calls for immediate attention to and correction of the problem that is causing it.
3. The red "OVER" zone, while not indicating a condition that will lead to as rapid corrosion attack, calls for the same corrective action as a reading in the "UNDER" zone. Steel allowed to remain in an over protected condition for a long period of time may suffer the loss of coatings (paint) on its underwater surfaces.

Indications outside the "SAFE" zone may be caused by many factors. Among them are: improper or inadequate DC engine or equipment grounding, improper AC electrical equipment installation, AC or DC electrical faults, improper shoreline safety ground installation, using the

wrong type of sacrificial anodes and loss of or contaminated sacrificial anodes. If the boat has an impressed current cathodic protection controller, the controller may be malfunctioning.

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