American Marine Inc.
54 Danbury Road Suite 172
Ridgefield, CT 06877 U.S.A.
Phone/FAX 914/763-5367
www.americanmarineusa.com

PINPOINT™
ORP Controller
REDOX

Users Manual

American Marine Inc.
54 Danbury Road Suite 172
Ridgefield, CT 06877 U.S.A.
FAX/Phone 914/763-5367
www.americanmarineusa.com

PINPOINT ORP Controller USERS Manual

I. **Overview**
II. General Specifications
III. Displays & Adjustments
IV. Important Note on Probe Placement
V. Adjusting the Controller Setpoints
VI. Connecting Controlled Devices

I. Overview

This device consists of an ORP Monitor and electronics, which control external devices, based on the ORP reading.
It is important that you understand these instructions and it is critical that you follow the cautions in this manual. Most users will be controlling the addition of ozone gas into their system with this instrument and there can be undesirable results if ozone is added to the system in an uncontrolled fashion. It is critical that one pay special attention to the placement of the ORP probe in the system. You must frequently check the calibration and age of the ORP probe. Control electronics are not human, they are not intelligent and they can not "know" when something has happened to make their input or output invalid. If the probe is not immersed in the system, it will no longer be reading the correct ORP and ozone gas may be added in a completely uncontrolled fashion. Installing an ORP Controller on your system does not mean that you no longer have to pay attention to it. You must still monitor the aquarium so that you can note when a problem exists and correct it in a timely fashion.

II. GENERAL SPECIFICATIONS

ORP Measurement Range –1,999 to +1,999 mV
ORP Setpoint Range 0 to 1,000 mV
3 1/2 Digit LCD Display
Resolution 1 mV Unit
2 Independent 5 Amp (110 VAC) Relay Outputs

III. Displays and Adjustments

ORP Display
ORP Monitor Adjustment & Instrument Status
Controller Set Point Block
Display Mode
Controller Status LED's
110 VAC Outlets (#1 &2)
Platinum Tip ORP Probe
ORP Calibration

UPPER LEFT ORP Display

The 3 1/2 digit LCD (Fig. A) at the top left of the controller displays a numeric value corresponding either to the ORP, or the controller setpoints.

LOWER LEFT (ORP monitor Adjustment & Instrument Status)

The red POWER LED (Fig. B) is illuminated when the power is turned on to the controller. The ORP LED (Fig. C) is illuminated when the display is indicating the ORP as measured through the probe. The ORP LED is off when the display is indicating either the high or low controller setpoints.

CENTER (Controller Setpoint Block)

There are two potentiometers that are used to adjust the controller setpoints. They control the RANGE (Fig. D) and CENTER VALUE (Fig. E) of the controller, respectively. Detailed information regarding their adjustment is given later in the ADJUSTING THE CONTROLLER section.

LOWER RIGHT (Display Mode)

The position of the SLIDE SWITCH (Fig. F) will determine what the LED display will show. At the center position, the display indicates the ORP that the probe is measuring, and the red ORP LED (Fig. C) at the lower left of the instrument will be illuminated. Sliding the switch up or down will cause the display to show the high and low controller setpoints, respectively.

UPPER RIGHT (Controller Status LED's)

There are a total of 4 LED's here. The upper row (Fig. G) shows the status of the 110 VAC outlets, which you will find, on the back of the controller beneath the LCD ORP display. The lower LED lights (Fig. H) are activated when the slide switch is placed in either the HIGH or LOW position.

110 VAC OUTLETS

There are two outlets, which will be energized when the ORP is above (outlet #1) or below (outlet #2) the controller setpoints. A common application for the controller will be to control the addition of ozone gas to the system. Since the addition of ozone gas raises the ORP, an ozonizer would be plugged into the LOW control outlet (Outlet #2).

ORP Probe

An ORP electrode is supplied with the controller. As shipped, a plastic bottle will protect the end of the electrode. Gently remove the bottle. There is a small amount of fluid on the sponge fiber inside the bottle. It is a mixture of #4.0 calibration fluid + 3M KCL which is commonly known as storage fluid. There is a suction cup attached to the electrode, which may be used to secure it, or a user-devised scheme of holding the electrode may be employed.

ORP Calibration (Lower Left)

For the highest precision you should calibrate the ORP probe immediately and every month thereafter to insure readings. Attach the probe BNC connector to the controller and place the selector switch to the middle (read) position. Insert the ORP probe tip into the pouch containing the ORP 400mV calibration fluid. Turn the CALIB adjustment screw (Fig. I) with the supplied screwdriver to tune the probe to 400 mV. Discard the calibration after use. Wash off the probe with fresh water before placing into the aquarium.

IV. PROPER PLACEMENT OF THE ORP ELECTRODE

When the controller is operational, it is critical that the tip (bottom 1-inch) of the electrode be immersed in the system at all times. If the water level falls below the lower pink band of the electrode, the ORP probe will not read properly. If the erroneously measured ORP is higher than the controller setpoint, devices connected to that outlet will remain permanently ON, irrespective of the actual ORP.

Take some time to determine how much the fluid level around the probe will fluctuate. Adjust the position of the probe accordingly.

Consider the final placement of the probe and attach it securely so that it remains in position. Be sure to check the probe position occasionally. Complacency usually sets in when you feel that "Everything is running fine".

V. ADJUSTING THE CONTROLLER SETPOINTS

The PINPOINT ORP Controller is capable of controlling ORP within the range of pH 0 through 1,000 mV. After the selection of the ORP setpoint, you will find that the controller can create a span around this setpoint, both above and below, from about +/- 10 mV units to +/- 100 mV units.

Two adjustment screws in the setpoint block will determine the controller ORP setpoints. The right adjustment screw determines the "center value" or the point halfway between the high and low setpoints. Note that the Center Value is NOT directly displayed and must be calculated. The left adjustment screw controls the range both above and below the selected ORP setpoint.

As an illustration of how the two adjustments are related, consider the following:

When the measured ORP falls to a value below the LOW setpoint, the device attached to the LOW outlet is activated and will remain ON until the ORP is brought to the center value at which time it will be shut off.

Adjusting the Controller Setpoints

1. Determine the “Center Value” that you wish to establish and the range around this center value you feel is acceptable (between 10 and 100 mV units). Remember, if you are only adding ozone gas, you will have ORP control in only one direction from a LOW value to the Center Value.
2. Turn the range adjustment screw to its minimum setting.
3. Move the display mode slides switch (HIGH/READ/LOW; on the right side of the controller) between the high and low setpoints to show the ORP range presently selected. Slide the switch to the LOW position.
4. By turning the CENTER VALUE adjustment screw with a fine blade screwdriver, adjust the lower limit to about 10 mV below the center value you have determined is best for your application.
5. Alternately display the high and low ORP controller settings and take the average by adding the high and low setting together then dividing by 2. The result is the Center Value.
6. Now adjust the range adjustment screw to give the desired ORP range, Again, use the display mode switch to show the high and low values. When they are acceptable to you, return the display mode switch to the READ position, and verify that the red ORP LED at the lower left corner of the instrument is ON. You have now established the controller setpoints.

VI.CONNECTING CONTROLLED DEVICES

The PINPOINT ORP Controller is capable of driving devices to control both the high and low ORP limits of the system.

When the measured ORP is greater than that of the high ORP limit you have established, Outlet 1 will be energized which will activate a device to lower the ORP (if you so desire). When the measured ORP is lower than the low ORP limit, Outlet 2 will be energized which will activate a device to raise the ORP. There are also LED’s on the front of the controller which are illuminated when the respective outlets are turned on.

You should make every effort to insure that the pumps, ozonizers or valves you attach are of good quality and checked frequently.

Copyright / Warranty

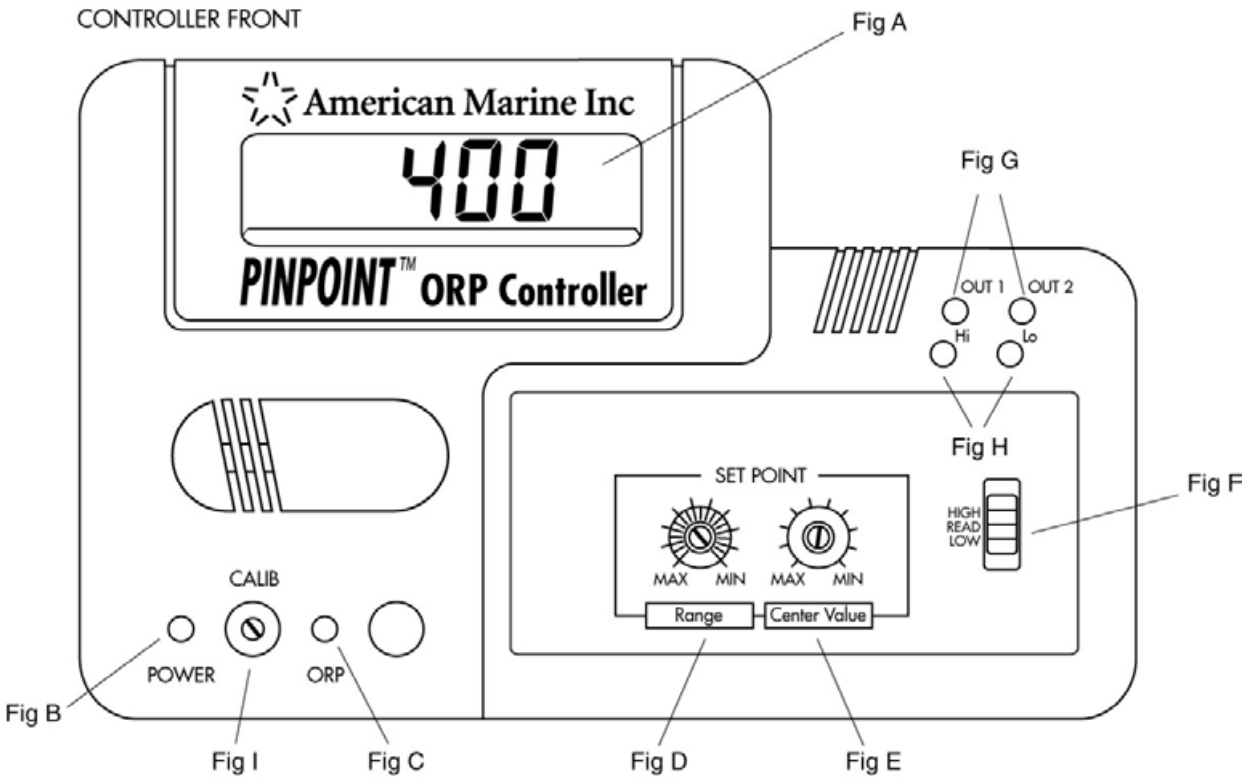
PINPOINT ORP Controller by American Marine inc. is warranted to be free of defects in Material and workmanship for a period of 2 years from date of sale. Positive proof of purchase is required for warranty claim.

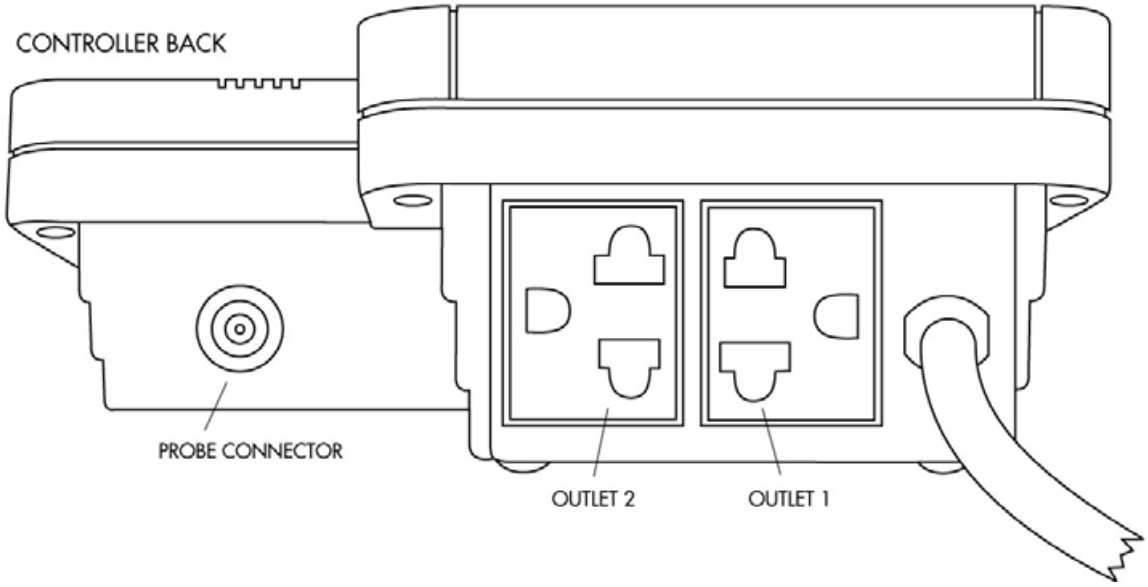
American Marine Inc. will not be liable for any costs of removal, installation, transportation charges, or any other charges, which may result in connection with a warranty claim.

American Marine Inc. will not be liable for any damage or wear to products or livestock caused by abnormal operating conditions, water damage, abuse, misuse, unauthorized alteration or repair or if the product was not installed in accordance with the printed operating instructions.

Any defective product to be returned must be sent freight prepaid with appropriate documentation supporting the warranty claim. Replacement or repair will be at the discretion of American Marine Inc. Typical turnaround time within 48 hours. Overnight delivery available.

American Marine Inc.
54 Danbury Road Suite 172
Ridgefield, CT 06877 USA
FAX/Phone 914 763 5367
www.americanmarineusa.com


CONTROLLER FRONT
Fig A
American Marine Inc
400
PINPOINT™ ORP Controller
Fig G
OUT 1
OUT 2
Hi
Lo
Fig H
SET POINT
MAX
MIN
MAX
MIN
Range
Center Value
HIGH
READ
LOW
Fig F
CALIB
POWER
ORP
Fig B
Fig I
Fig C
Fig D
Fig E


CONTROLLER BACK
PROBE CONNECTOR
OUTLET 2
OUTLET 1