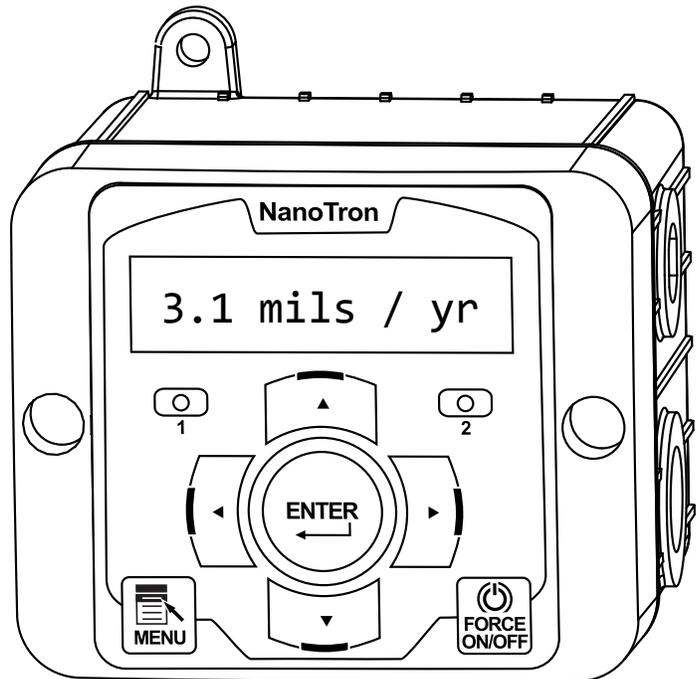


NanoTron-M Corrosion Monitor and Control

Installation Maintenance Repair Manual



Advantage Controls
P.O. Box 1472
Muskogee, OK 74402
Phone: 800-743-7431
Fax: 888-686-6212
www.advantagecontrols.com
email: support@advantagecontrols.com

6/09

Table of Contents

Contents	Page
I. Introduction.....	3
II. Description.....	3
III. Installation	
Electrical Wiring.....	3
Logic and Relay Cards	4
Mounting Instructions	4
IV. Front Panel Description	5
V. System Operation Overview.....	5
Description of Menus.....	5
VI. Menu Map.....	6
VII. Corrosion Rate Measurement Notes	7
VIII. Warranty & 30 Day Billing Memo Policy	7

I. Introduction

NANO-M controllers are microprocessor based menu driven units for corrosion monitoring with set point relay activation. All settings are entered into the controller through a simple front panel keypad which includes relay test keys and LED indicating lights.

II. Description

NANO-M units are designed to monitor the linear polarization resistance (LPR) between two metal tips. Relative corrosion rates are calculated by measuring polarization voltage and current. All units include:

- * Set point relay control with differential, high and low alarm.
- * Conductivity variable manual input.
- * Scalable 4-20mA output of corrosion rate.
- * A "force on" timer that allows for manual activation of the relay for a user defined amount of time.

Corrosion Rate Measurement

The linear polarization rate (LPR) is a relative corrosion rates calculated by measuring polarization voltage and current between two metal coupons. The NANO-M converts LPR to an annual rate of metal loss assuming linear constants to display a corrosion rate in mils per year (mpy) where 1 mil =0.001.

NANO-M units should only be used in conductive fluids like cooling towers, chillers, boilers, waste water and potable water systems.

For more information detailing the LPR theory in measuring corrosion rates refer to ASTM and NACE publications.

III. Installation

Electrical Wiring

The controller has internal regulated power supply options for 115 VAC or 240 VAC on the incoming wiring. Output relay is protected with a replaceable fuse. Relay output voltage will equal the incoming line voltage.

Prewired units are supplied with a 16 AWG cable with a 3-wire grounded USA 115 volt plug for incoming power and 18 AWG 3-wire grounded receptacle cord for the control relay output. Conduit units are supplied with liquid tight fittings and adaptors for easy hard wiring to supplied connectors.

NOTE: Liquid tight fittings and some labeled signal leads are provided for signal (low voltage) connections, such as water meter inputs.

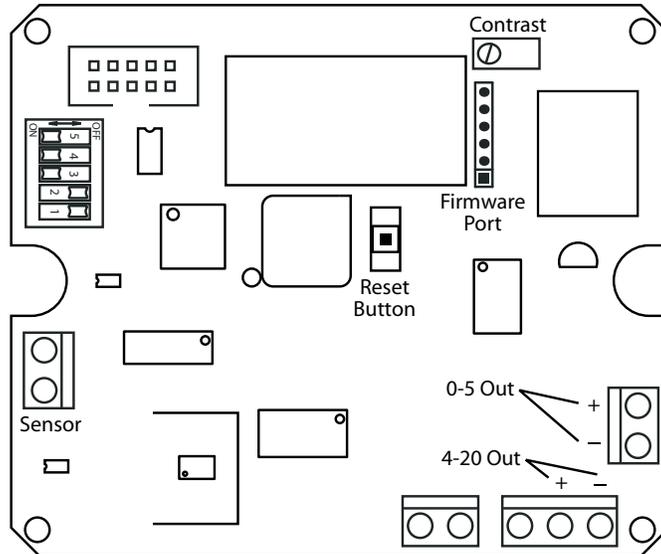
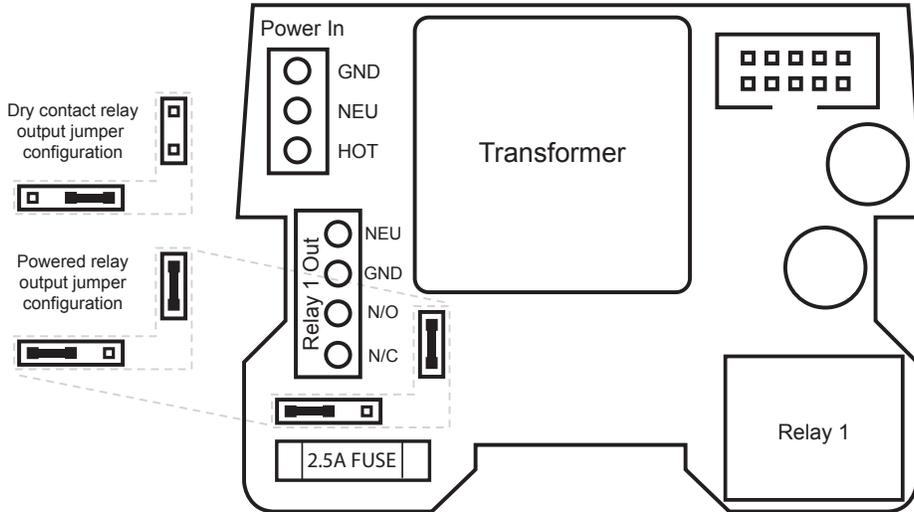


WARNINGS

1. The controller should be connected to its own isolated circuit breaker, and for best results, the ground should be a true earth ground, not shared. Wiring must be done according to all applicable local codes.
2. Power (line voltage) must be disconnected while making any connections. If power is supplied to the unit, line voltage will be present on the relay cards.
3. Low voltage signal wires (probes, flow switch, water meter, etc.) should never be run in conduit with high voltage wires.
4. Sensor cable can be extended up to 100 feet using single twisted pair, shielded cable 2 x AWG 22. Connect shield to controller ground and nothing a sensor end.

Logic and Relay Cards

Relay Card



Mounting Instructions

Select a mounting location that provides the operator easy access to the unit and a clear view of the controls through the cover of the controller. The unit should be located convenient to grounded electrical connections, the required sample line plumbing, and installed on a stable vertical surface.

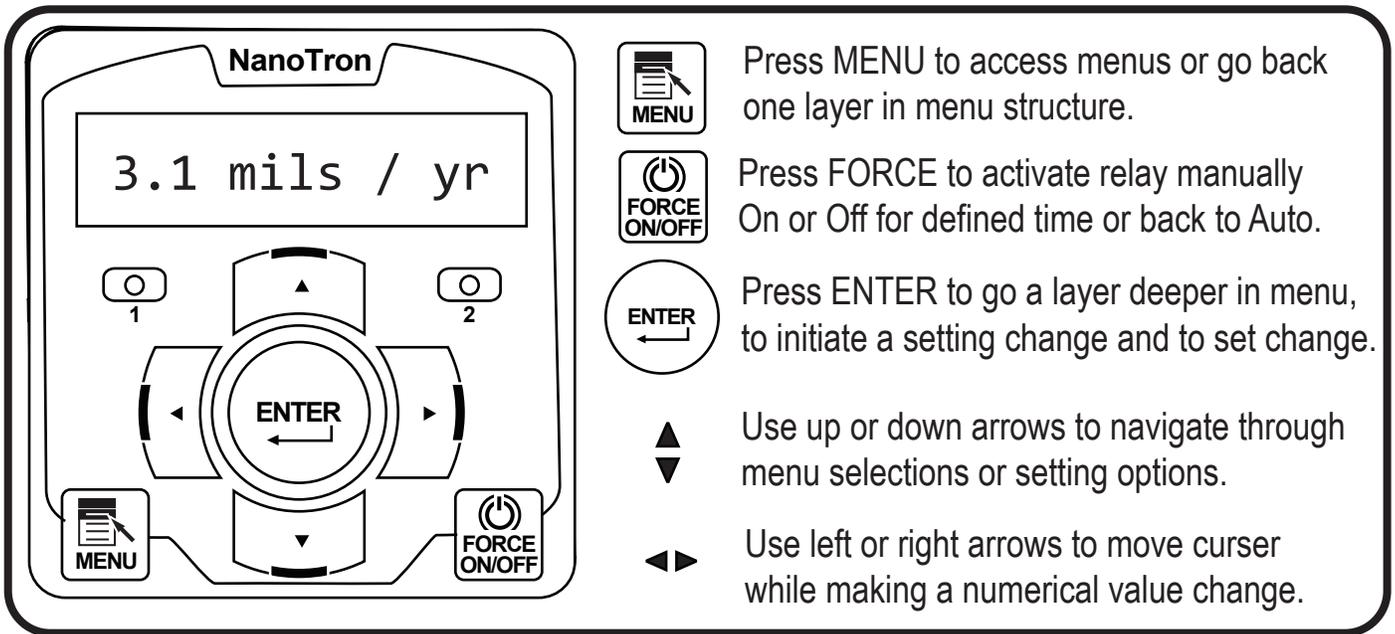
WARNING: Avoid locations that expose the controller to direct sunlight, vapors, vibration, liquid spills or extreme temperatures; less than 0°F (-17.8°C) or greater than 120°F (50°C). EMI electromagnetic interference from radio transmissions and electric motors can also cause damage or interference and should be avoided.

Sensor Installation

Coupon sensor should be installed with flow coming into the coupon tips. Do not handle the coupons with bare hands, oil and dirt from your hands will cause measurement errors. Clean coupon tips with isopropyl alcohol if they are fouled.

A constant flow rate is required for reproducible corrosion rate readings, typically 3 GPM.

IV. Front Panel Description



V. System Operation Overview

Description of Menus

NanoTron controllers have three modes of operation, Run, Menu and Force. All menus are circular. Pressing the DOWN key will display the next line of information on the display.

Run - This mode is for normal operation. The control relays will only be automatically active in this mode. In the Run mode, the display will read system values. If an alarm is present, the display flashes with the alarm status.

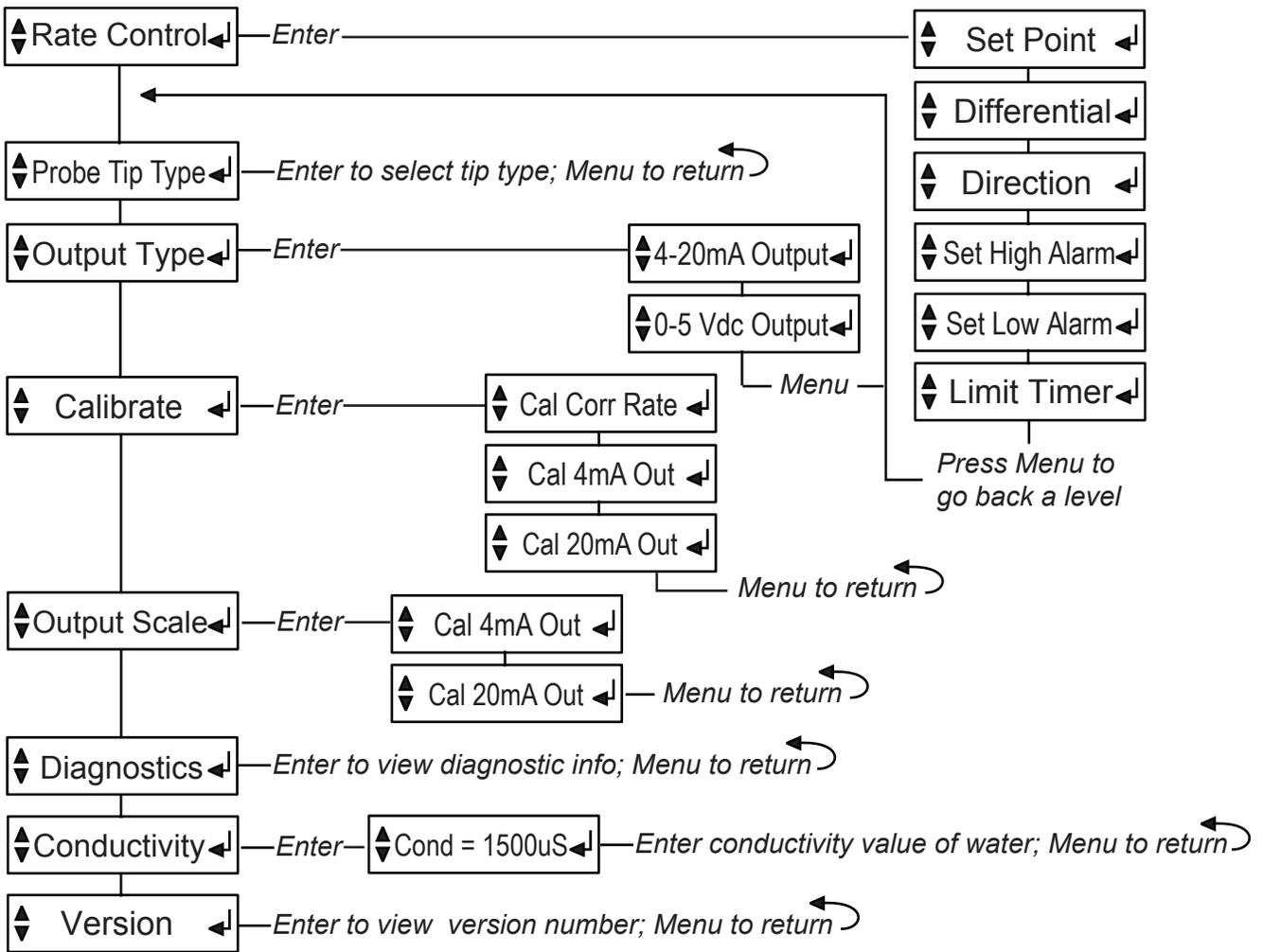
The Run menu will display values such as Mils / yr and other values depending upon the features present on the unit. The unit will automatically return to the Run mode if no keys are pressed for three minutes.

Menu - This mode is used to make adjustments to settings and readings on the controller. To access the Menu mode from the run screen, press the Menu key. Use the up or down arrow to scroll through the various menus. When you want to access a specific menu, press the Enter key. Once you have entered a sub-menu you will be able to step through that menu's options with the down arrow key.

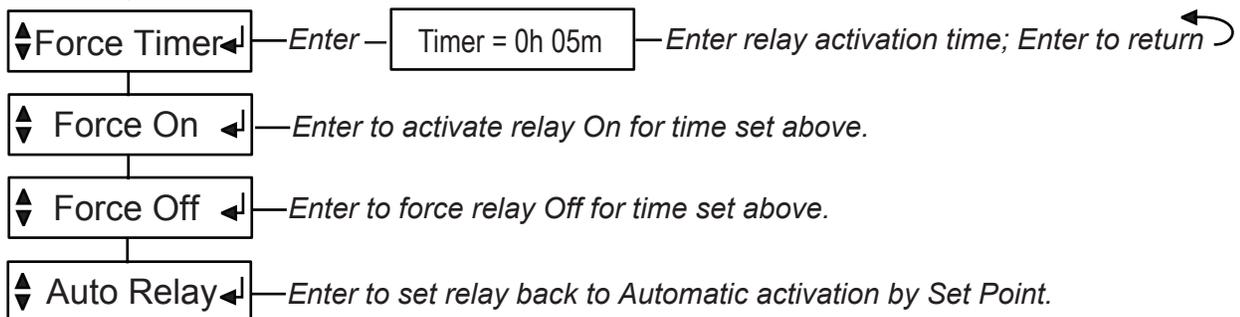
Force - The relay may be forced on or off for a user defined amount of time. Press the Force button to access selections for amount of force on time, to force on or off or to go back to automatic. Relay activity will go back to automatic operation after force time has expired.

VI. Menu Maps

Main Menu Circle



Force On/Off Menu



VII. Corrosion Rate Measurement Notes

1. Coupons that are not pre-treated will initially corrode at very high rates.
2. Pre-treating coupons with high concentrations of inhibitor may not reflect typical protective film resulting in lower than normal corrosion rates.
3. Constant flow rates are required for reproducible corrosion rates, typically 3 gpm.
4. Variable flow rates usually result in non-reproducible results.
5. Lower temperature readings can result in lower corrosion rates. Seasonal variations require comparison testing concurrently of product.
6. Do not install coupons at the hottest point of a cooling loop. Corrosion rates from the hottest point may result in non average (higher) rates.
7. Scaled coupons will show low rates that may not be representative.
8. Lower pH readings increase steel corrosion rates.
9. General corrosion rates increase with increased conductivity values. The conductivity value in the NANO-M should be kept current for best results.

VIII. Manufacturer's Product Warranty

Advantage Controls warrants units of its manufacture to be free of defects in material or workmanship. Liability under this policy extends for 24 months from date of installation. Liability is limited to repair or replacement of any failed equipment or part proven defective in material or workmanship upon manufacturer's examination. Removal and installation costs are not included under this warranty. Manufacturer's liability shall never exceed the selling price of equipment or part in question. Advantage disclaims all liability for damage caused by its products by improper installation, maintenance, use or attempts to operate products beyond their intended functionality, intentionally or otherwise, or any unauthorized repair. Advantage is not responsible for damages, injuries or expense incurred through the use of its products. The above warranty is in lieu of other warranties, either expressed or implied. No agent of ours is authorized to provide any warranty other than the above.

30 Day Billing Memo Policy

Advantage Controls maintains a unique factory exchange program to ensure uninterrupted service with minimum downtime. If your unit malfunctions, call 1-800-743-7431, and provide our technician with Model and Serial Number information. If we are unable to diagnose and solve your problem over the phone, a fully warranted replacement unit will be shipped, usually within 48 hours, on a 30 Day Billing Memo. This service requires a purchase order and the replacement unit is billed to your regular account for payment. The replacement unit will be billed at current list price for that model less any applicable resale discount. Upon return of your old unit, credit will be issued to your account if the unit is in warranty. If the unit is out of warranty or the damage not covered, a partial credit will be applied based upon a prorated replacement price schedule dependent on the age of the unit. Any exchange covers only the controller or pump. Electrodes, liquid end components and other external accessories are not included.

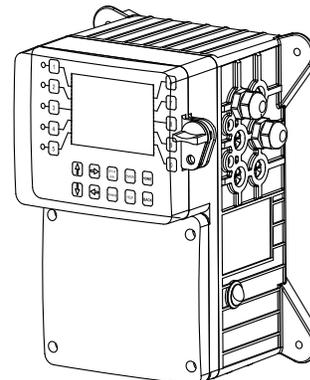
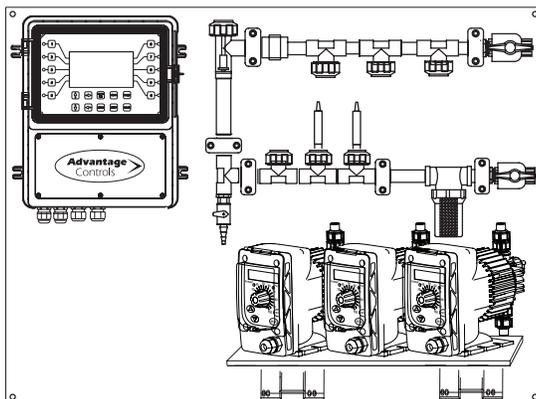
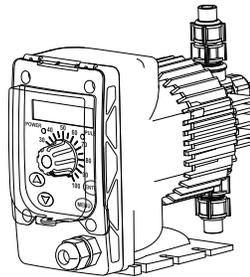
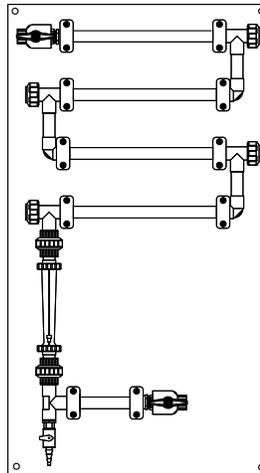
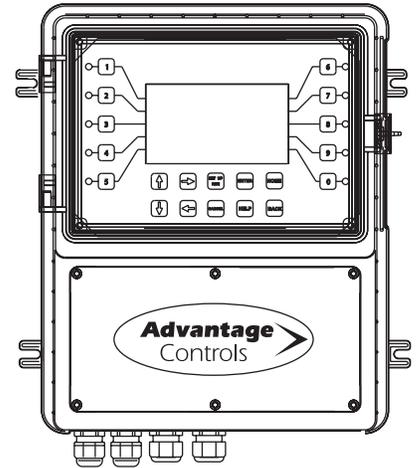
FCC Warning

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instruction, may cause interference to radio communications. It has been type tested and found to comply with the limits for a class A computing device pursuant to subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial or industrial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures necessary to correct the interference.

Get the Advantage in Water Treatment Equipment

Advantage Controls can give you the *Advantage* in products, knowledge and support on all of your water treatment equipment needs.

- Cooling Tower Controllers
- Boiler Blow Down Controllers
- Blow Down Valve Packages
- Solenoid Valves
- Water Meters
- Chemical Metering Pumps
- Corrosion Coupon Racks
- Chemical Solution Tanks
- Solid Feed Systems
- Feed Timers
- Filter Equipment
- Glycol Feed Systems
- Pre Fabricated Systems



Get the Advantage

