
W A L C H E M

IWAKI America Inc.

**WALCHEM LINEAR POLARIZATION RESISTANCE
CORROSION SENSORS
Instruction Manual**

Notice

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5 Boynton Road, Holliston, MA 01746 USA
(508) 429-1110
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1.0 Introduction

The corrosion I/O card powers two metal electrodes made from the same material as the parts of the cooling tower that need to be monitored for corrosion. A small voltage is applied to the electrodes, scanning step-wise over a range, and the current generated is measured. The current is used to calculate the polarization resistance. The lower the resistance, the higher the corrosion rate. This is converted into the corrosion rate.

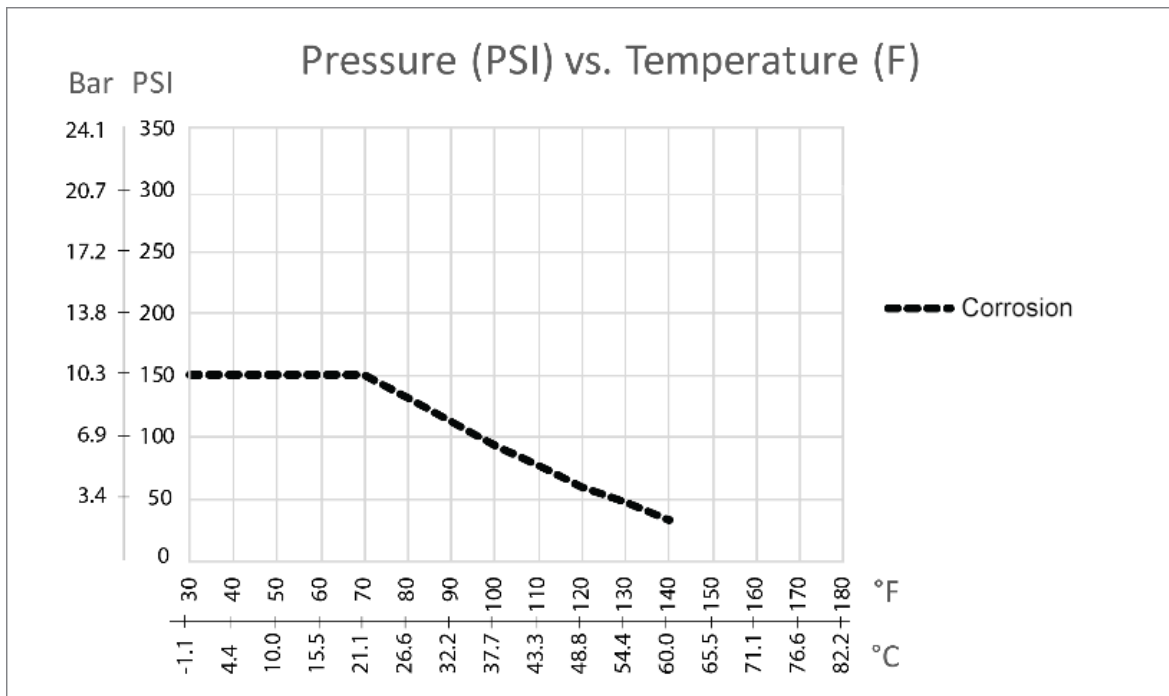
2.0 Specifications

2.1 Measurement Performance

Range	Resolution
0-2 mpy or mm/year	0.001 mpy or mm/year
0-20 mpy or mm/year	0.01 mpy or mm/year
0-200 mpy or mm/year	0.1 mpy or mm/year

2.2 Mechanical

Pressure (see graph)	0-150 psi (0-10 bar)	
Temperature (see graph)	32-158 °F (0-70 °C)	
Fitting Process Connection	3/4" NPTM mounting fitting	
Electrode Material	Sold separately	
Body Material	Glass filled reinforced Polypropylene	
O-Ring Material	FKM	
Maximum cable length	100 feet (30 m)	
Standard Cable lengths	3 feet (1 m)	20 feet (6 m)



3.0 Installation

3.1 Mechanical Installation

General Guidelines

- Mount the sensor as close as possible to the controller. Less than 20 feet (6 m) is recommended.
- Take care to shield the cable from background electrical noise properly.
- Maximum cable length is 100 feet (30 m). A junction box and shielded cable (p/n 100084) are available to extend the standard length.
- Always route sensor cable with at least 6" (15 cm) separation from AC voltage wiring.
- If cable is installed in metal conduit, either flexible conduit should be used or some other provision made for removal of sensor from the process for maintenance.
- Position the sensor such that a fresh, representative sample of the solution is available.
- Position the sensor such that air bubbles will not be trapped within the sensing area.
- Position the sensor where sediment will not accumulate within the sensing area.
- Do not use the sensor if oil is present in the sample.

In-Line Installations

In-line mounted sensors must be situated so that the tee is always full and the sensors are never subjected to a drop in water level resulting in dryness. Refer to Figure 1 for typical installation.

Tap off the discharge side of the recirculation pump to provide a minimum flow of 1.5 gallon per minute (5.7 liters per minute) with an ideal flow rate of 5 gpm (19 lpm) through the flow switch manifold. The sample must flow into the bottom of the manifold in order to close the optional flow switch, and return to a point of lower pressure in order to ensure flow. Install an isolation valve on both sides of the manifold to stop flow for sensor maintenance.

IMPORTANT: To avoid cracking the female pipe threads on the supplied plastic plumbing parts, use no more than 3 wraps of Teflon tape and thread in the pipe FINGER tight plus 1/2 turn! Do not use pipe dope to seal the threads of the flow switch because the clear plastic will crack!

If the sensor cable could be exposed to moisture (rain, hosing, etc.) it must be protected from it.

The sensor should not be installed unless the o-rings/electrodes that match the metallurgy to be examined are attached to the steel threaded rods. Standard corrosion electrodes are 5 cm² surface area. Do not touch the metal electrodes; they should be clean and free of any scratches, oils or contamination to accurately measure the corrosion. If more than one metal is to be used, the most noble metal should be first.

The sensor should be mounted horizontally. The sensor should ideally be installed in the side branch of a 1" or ¾" tee, with the flow entering the tee through the top branch and flowing away from the base of the sensor, towards the tips of the electrodes. The sensor is marked with a notch so that the electrodes can be aligned such that they each see equal flow.

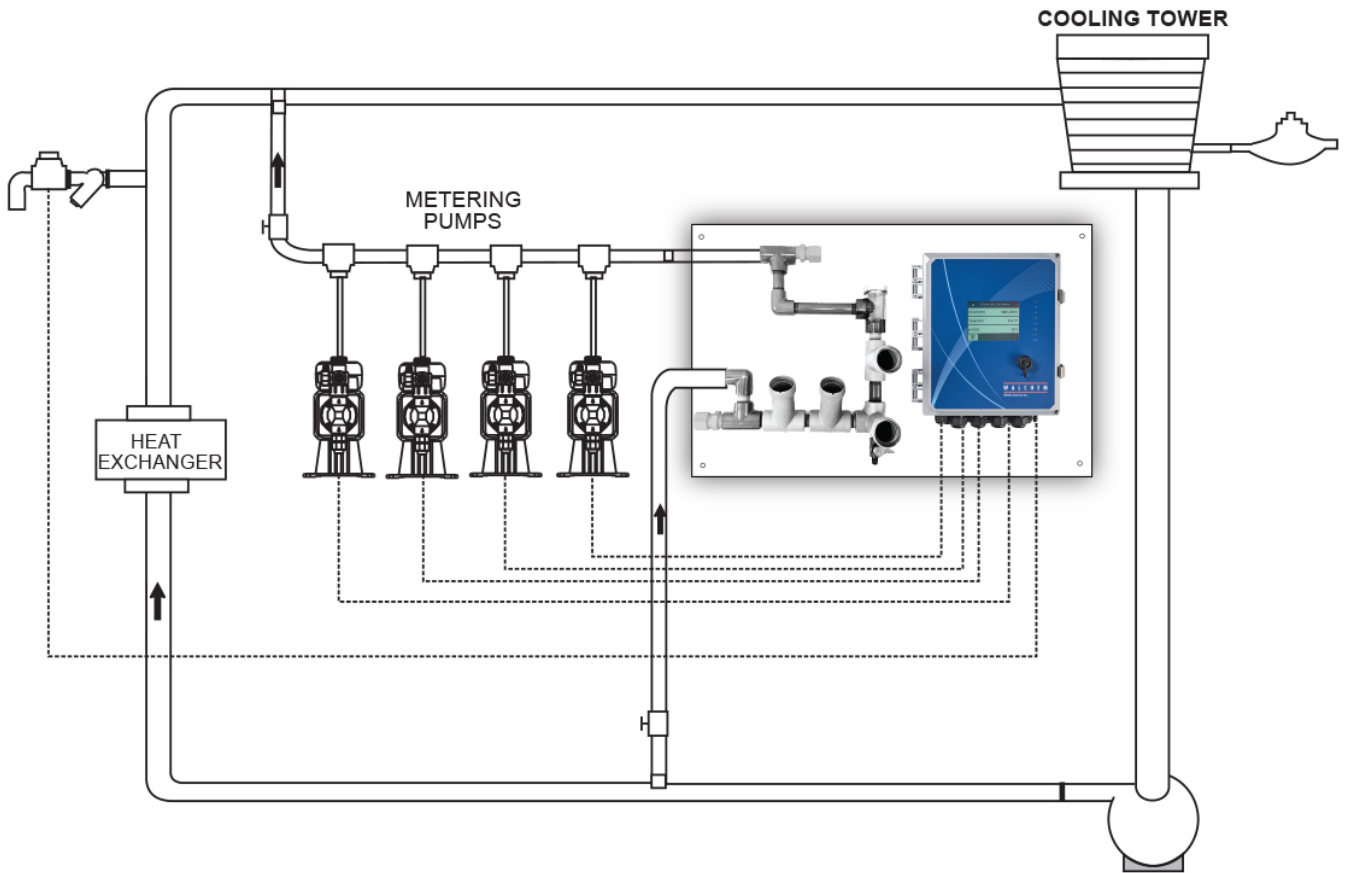
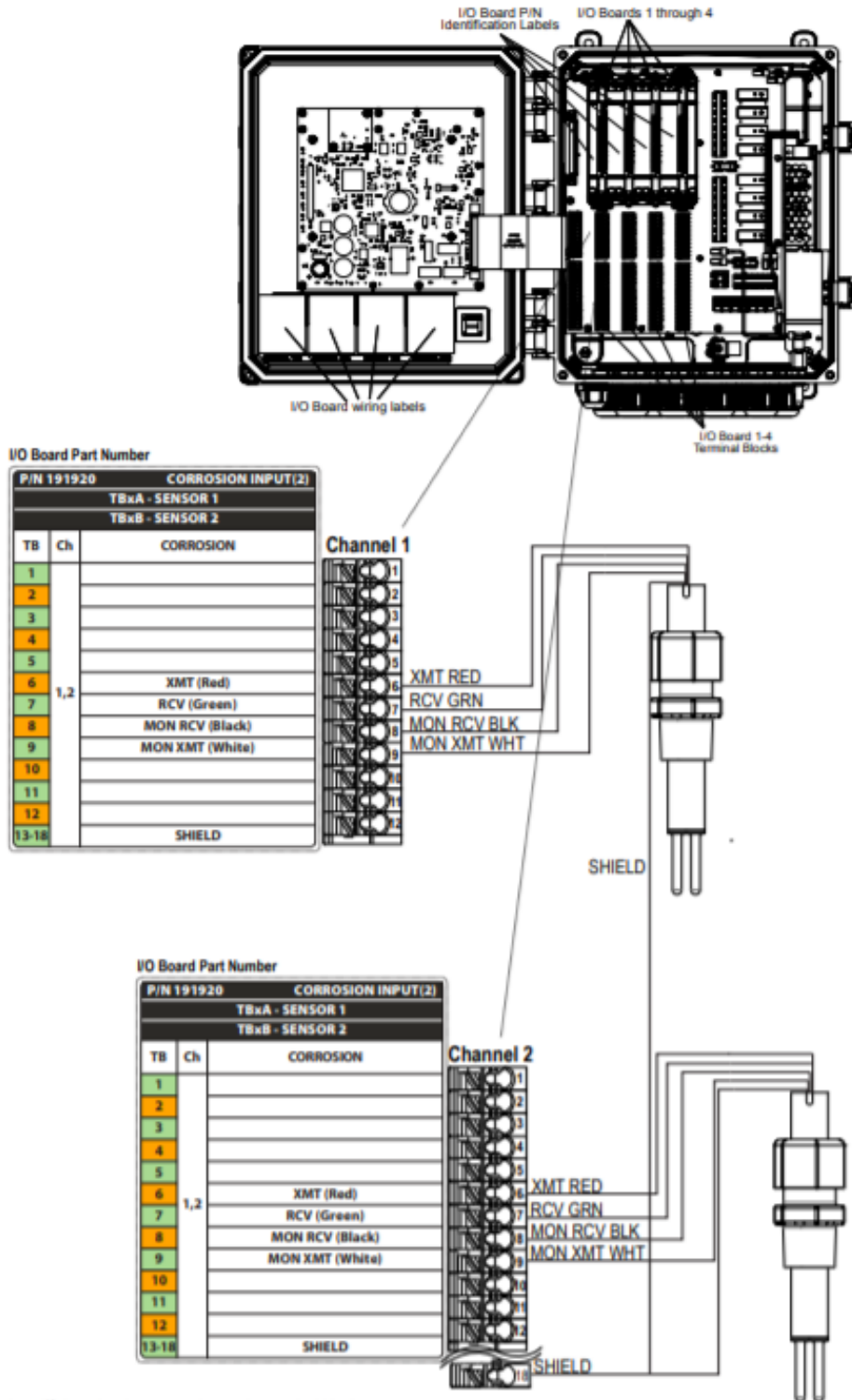


Figure 1 Typical Installation

3.3 Electrical Installation

Route the cable through one of the water tight cable glands on the W900 series controller, and connect the wires matching the wire label with the terminal block label.



Notes:
 Identify P/N 191920 I/O Board and connect wires to the terminal blocks directly below the I/O slot that the board is in.
 Use the wiring label located on the front panel that has a matching I/O part number.
 Either channel can support any of the sensor types listed.

4.0 Maintenance

4.1 Replacing electrodes

The electrodes will need to be replaced periodically when they too heavily corroded, pitted or coated. When in doubt, it is better to replace electrodes than to try to clean. The expected life of the electrodes is dependent upon conditions in the process.

- Stop flow to the sensor and remove it from the mounting gland.
- Remove the spent electrodes and their o-rings, by unscrewing from the threaded rods on the sensor.
- Using gloves to ensure the electrodes remain uncontaminated by oils from your hands, screw new electrodes and their o-rings onto the threaded rods, hand tightening until the o-rings are seated.
- If you have two different metals in the same manifold, ensure that the electrodes you place on the sensor match the programmed alloy for that sensor input channel.
- Reinstall the sensor in the mounting gland, using the notch on the sensor to align the electrodes so they are perpendicular to the flow.
- In the controller programming, press “Replace Corrosion Electrode” to reset the timers for the Electrode Alarm (the reminder to change electrodes) and the Stabilization Time (locks out control during the initial period of high readings while the electrodes acclimate to the process). Adjust the settings of these timers based on your experiences with the past set of electrodes if necessary.