

# AL 250 ROPM

## Quick Start Guide

### READ THIS FIRST!



- Failure to follow proper instructions may cause one of the following to occur: loss of life, personal injury, property damage, damage to equipment connected to this product, damage to this product, and invalidation of warranty.
- It is the user's responsibility to ensure that he or she has received the proper equipment for his or her application. Verify that all documentation (whether printed or on disk) corresponds to the product received. Call 1-505-334-5865 if this is not the correct manual.
- Follow all warnings, cautions, instructions, and notices in the operating manual and marked on the product. Use only qualified personnel to install this product. Ensure that all operators of this product are properly trained in installation, operation, and maintenance.
- Install the equipment following the instructions in the operating manual. Follow local safety and electrical codes.

### WARNING



- **Installation and maintenance of this product may produce a risk of electrical shock.**
- **Disconnect main power and any power to relay contacts before servicing this product.**
- **Do not energize this equipment with the electrical enclosure door open.**
- **All wiring must be rated for 240 VAC.**
- **The non-metallic enclosure used on this product does not provide grounding via conduit connections. Separate ground connections must be made.**
- **Unused conduit openings or cord strain reliefs must be sealed with NEMA 4X or IP65 plugs.**
- **Installation must be in accordance with the National Electrical Code or any other applicable local codes.**

## Installation

### Items Required for Installation

- Adjustable Wrench or Open-End Wrench Set
- Pliers
- Small Screwdriver (3/32" blade)
- Electric Drill with 1/4" Bit (for drilling mounting holes)
- Teflon Tape

### Mounting



The ROPM should be mounted on a smooth, vertical mounting surface on or near the RO system being monitored. When mounting the ROPM, sufficient room should be allowed at the bottom and at the right side of the device for access to the I/O and sample port connections. When equipped with the integral sensor assembly, do not mount the ROPM above equipment that is sensitive to water or moisture. It is common for leaks and drips to occur during normal use of the system particularly during calibration.

### Connections



**Liquid Sample Connections** – When using the integral sensor assembly, liquid sample connections must be made to the feed and permeate sensor manifolds at the bottom of the sensor housing. These connections may be made with 1/4" flexible tubing. Isolation valves should be mounted in the sample lines in order to isolate the ROPM during times of maintenance or calibration. There are also two drains from the sensor manifold. These should be open to atmosphere. **Do not pressurize the feed or permeate sample manifold by more than 50 psi by restricting the flow out of the drains.** Pressure samples may be connected by means of 1/8" thick walled nylon tubing. Pressure sample lines should also be equipped with isolation valves. Refer to the mounting diagram on the next page for locations of the liquid sample connections.

**Electrical Connections** - Screw terminals are provided for making connections for sensor inputs and power. Sensor and I/O terminals are located along the bottom of the rear of the AquaLynx<sup>®</sup> Model 250 in the door of the ROPM enclosure along with those on the expansion module (EMP) mounted on the backpanel of the ROPM enclosure. Power terminals are located on the short piece of DIN rail on the lower left side of the backpanel of the ROPM. Power should always be disconnected from the ROPM before making or changing any connections to sensors.

### Ground

A good common ground reference (earth ground) is essential for proper operation of the ROPM. A good earth ground or power circuit ground should be connected to the yellow and green grounding block on the DIN rail.

### Power

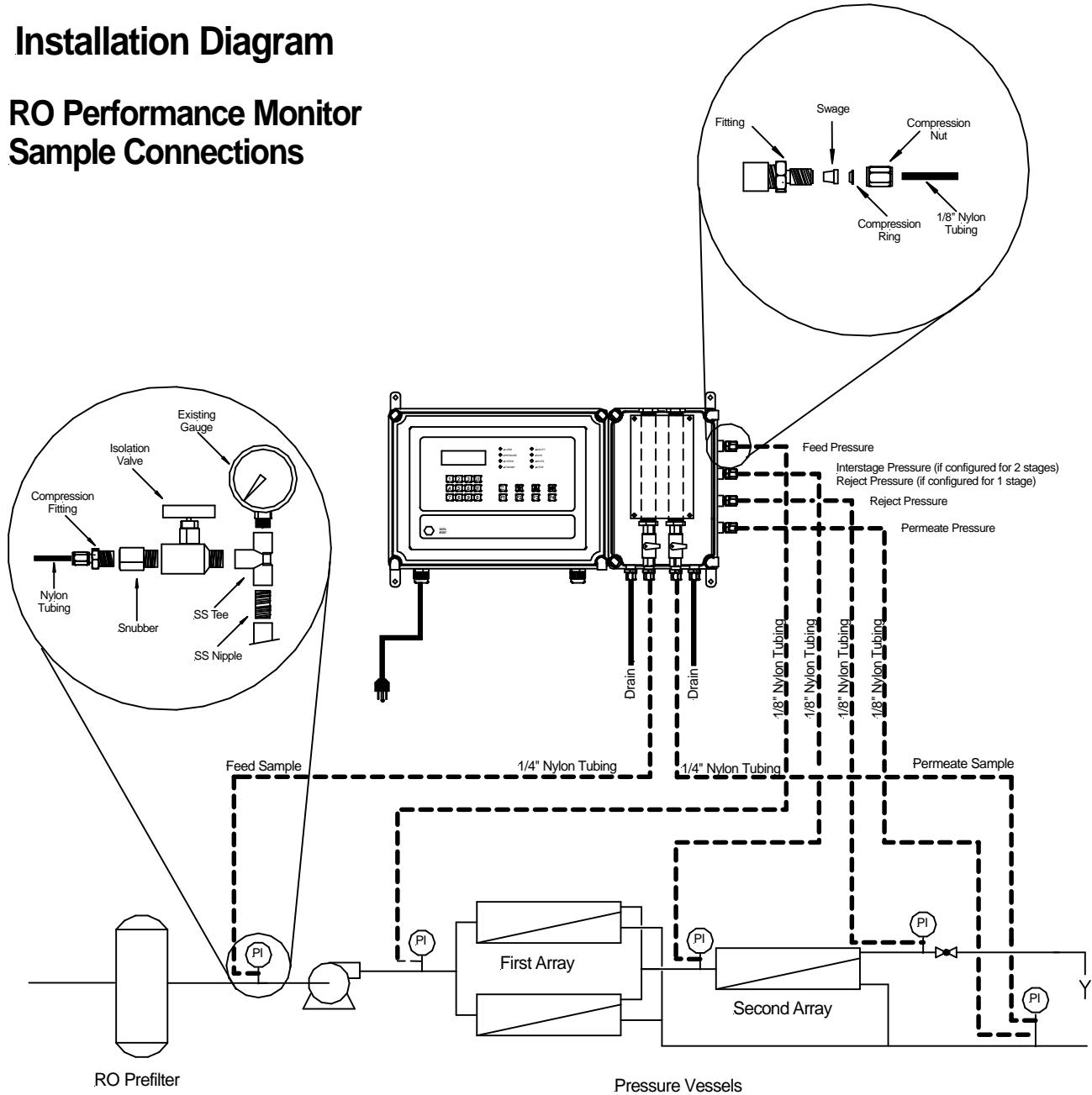
The ROPM requires 100-240 VAC, 60/50 Hz, 2 Amps. The primary voltage feeds a 24 VDC power supply equipped with internal circuit protection. This automatically opens the circuit when high DC current conditions exist. Systems subject to transient surges should be equipped with an appropriate power filter on the power input.

### I/O

The wiring diagrams for all input and output connections may be found in the ROPM Operating Manual.

# Installation Diagram

## RO Performance Monitor Sample Connections

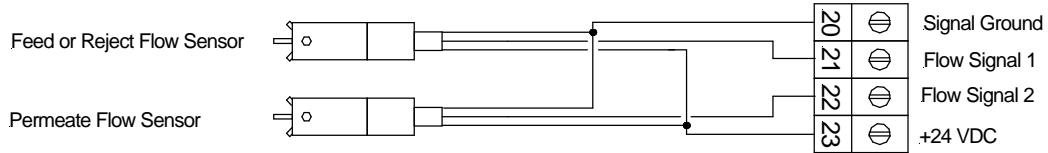


### Installation Notes

- Use Teflon tape on all threaded connections. Do not use pipe dope.
- Do not apply greater than 500 psig to pressure inputs.
- Do not restrict flow on drains from sensor manifold. Do not pressurized sensor manifold above 50 psig.
- For best results, only use components provided by RODI Systems.

## Flow

The ROPM is designed to operate with sinking pulse (three wire) type flow sensors. Signal terminations are provided for each flow input. Power and ground terminals must be shared for both sensors. The diagram below illustrates the flow connections to the main I/O board (mounted on the inside of the door of the ROPM enclosure).



Certain installations may require the use of a specialized flow interface board. Documentation for these boards is attached at the end of this Quick Start Guide.

## Modem

The optional modem for the Model 250 ROPM is mounted on the back of the Aqua-Lynx<sup>®</sup> Model 250. The modem is equipped with a standard RJ connector for connection to an analog phone line. Do not connect the modem to an intra-office digital phone line. Damage to the modem can occur. Once connected to a modem, the ROPM can be accessed by means of Windows-based AquaGraph software for remote monitoring or data retrieval.

## Configuration

At a minimum, the following calibration settings must be configured before operating the ROPM:

Calibration Settings		
Index	Setting	Details
8	Flow 1 K Factor	K factor for the permeate flow sensor in pulses per gallon.
9	Flow 2 K Factor	K factor for the feed or reject flow sensor in pulses per gallon.
36	Flow Configuration	Enter "1" if a feed flow sensor is connected to Flow Input 2. Enter "2" if a reject flow sensor is connected to Flow Input 2.
37	NDP at Startup	Enter the Net Drive Pressure (in psi) at startup to be used for the Normalized Permeate Flow calculation. Net Drive Pressure (NDP) is calculated as follows:  $NDP = (\text{Feed Pressure} + \text{Reject Pressure} / 2) - \text{Permeate Pressure} - (\text{Feed Concentration (in TDS)} / 100)$
38	Stage Configuration	Enter "1" if the ROPM is monitoring a single stage system. Enter "2" if the ROPM is monitoring a system with two or more stages. Make sure pressures are connected per the diagram shown on page 2.

The RODI Systems Model FSI-A analog flow signal isolator is designed to produce pulse signals from 4-20 mA analog transmitters. This allows the AquaLynx® water treatment monitor to receive flow signals from existing analog transmitters while isolating the analog signal from the AquaLynx®. The Model FSI-A incorporates the following features:

- **Receives Two 4-20 mA Analog Signals and Produces an Isolated Pulse Signal for Each**
- **Isolates Analog Signals from AquaLynx®**
- **Indicator LEDs Show Analog Signal Level for Each Channel**
- **Adjustable Pulse Rate for Each Channel**
- **Performs Square Root Extraction for DP Transmitters**
- **Screw Terminal Blocks**
- **12-30 VDC Input Power Supply (Receives Power from AquaLynx®)**
- **DIN Rail Mounting**

**Warning!** Disconnect all power from the AquaLynx® and the existing flow instruments before wiring the FSI-A.

Refer to the wiring diagram shown below. DC+, DC-, and signal connections for the two analog channels are made to terminals 1-4. Connections to the AquaLynx® are made to terminals 9-14. Connections to auxiliary instruments are made to terminals 5-8. No external power is required. Power is supplied to the FSI-A from the AquaLynx®.

## Calibration

The pulse outputs (in pulses per second) are factory calibrated as follows:

Low Level (4 mA) = preset to 0  
High Level (20 mA) = preset to 255

Do not change factory calibrations!

The user must calculate the K factors to be entered into the appropriate AquaLynx® Calibration Screens. Calculate the K factors as follows:

$$K \text{ (pulses/gal)} = \frac{255 \text{ pulses/sec} \times 60 \text{ (sec/min)}}{\text{Flow (gal/min)}}$$

The frequency used in this calculation refers to the high level frequency corresponding to a 20 mA signal. The flow used in the calculation refers to the flow rate represented by a 20 mA signal from the transmitter.

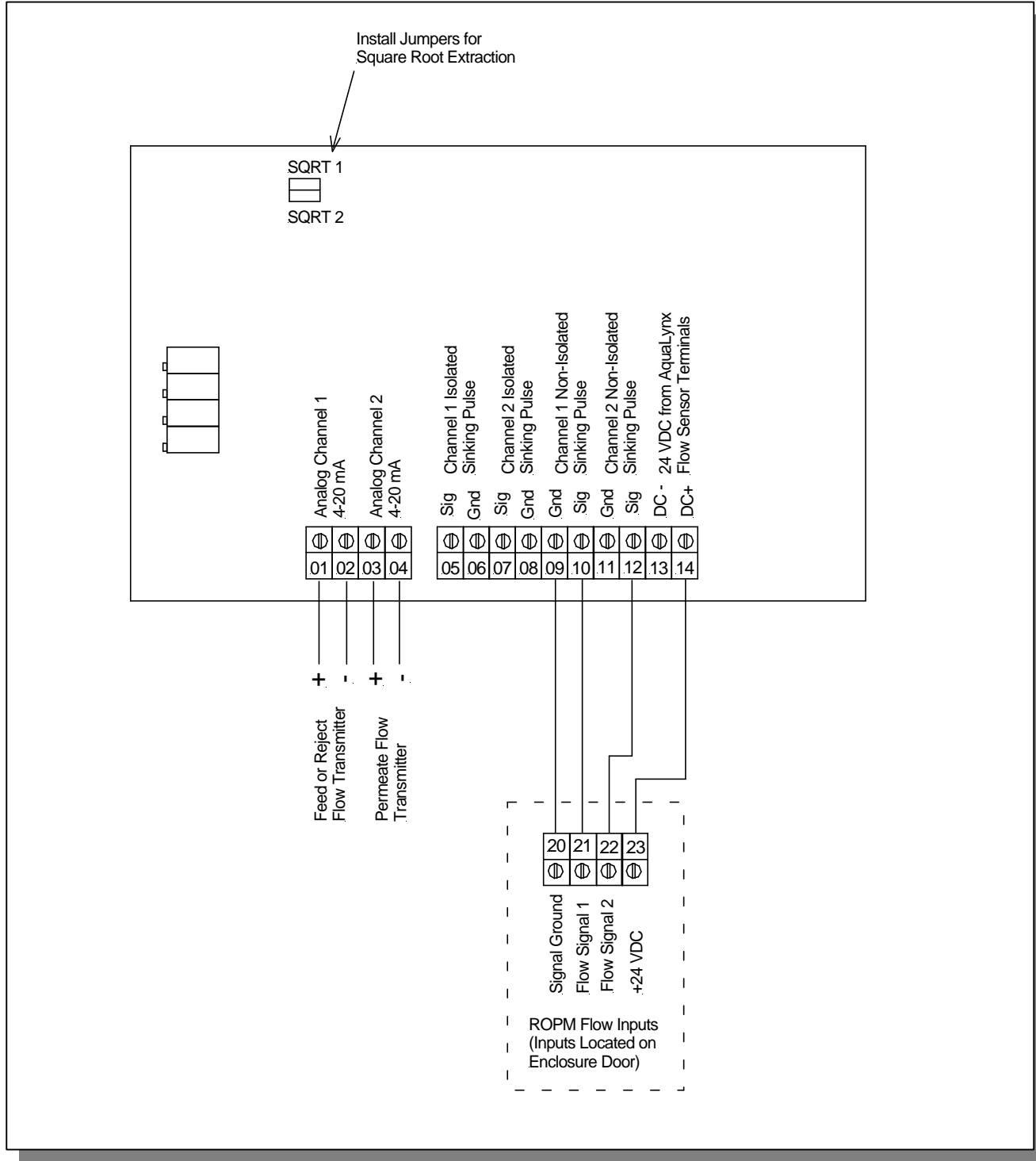
In some applications, the low level (4 mA) signal from the transmitter may not correspond to "0" gpm. If not, an offset may be entered in the AquaLynx® calibration settings to account for the difference (Calibration Screens 45-48).

## Square Root Extraction

Some installations use differential pressure measurements across an orifice to indicate flow rate. In these cases, the flow rate does not correspond to the differential pressure in a linear manner. Rather, the flow rate is a function of the square root of the differential pressure. When used with differential pressure measurement, the FSI-A should be configured for square root extraction. To do so, install the jumpers located at the top right side of the board. When the jumpers are installed, the pulse output from the corresponding channel will be a function of the square root of the analog input.

# Flow Signal Isolator, Analog

# Model FSI-A



# Flow Signal Isolator, Pulse

# Model FSI-SP

The RODI Systems Model FSI-SP flow signal isolator is designed to split flow signals from sinking pulse sensors. This allows the AquaLynx® water treatment monitor to receive flow signals from existing sensors while a second signal goes to existing flow instruments. The Model FSI-SP incorporates the following features:

- **Receives and Splits Signals from Two Sinking Pulse Flow Sensors**
- **Provides Power to Each Sensor**
- **Indicator LEDs for Each Flow Channel**
- **Screw Terminal Blocks**
- **12-30 VDC Input Power Supply (Receives Power from AquaLynx®)**
- **DIN Rail Mounting**

**Warning!** Disconnect all power from the AquaLynx® and the existing flow instruments before wiring the FSI-SP.

Refer to the wiring diagram shown below. DC+, DC-, and signal connections for the two sensors are made to terminals 13-18. Connections to the AquaLynx® are made to terminals 7-12. Connections to the existing or auxiliary instruments are made to terminals 1-6. No external

power is required. Power is supplied to the FSI-SP from the AquaLynx®.

If the K factor of the flow sensors is not known, it may be determined as follows:

1. Enter a value of "60" as the K factor in the AquaLynx® Calibration Screen. The value displayed by the AquaLynx® as the flow rate is now equal to the frequency produced by the sensor.
2. Determine the actual flow rate by reading the flow from the existing flow meter or use other means to determine the flow rate.
3. Calculate the K factor as follows:

$$K \text{ (pulses/gal)} = \frac{\text{Frequency (pulses/sec)} \times 60 \text{ (sec/min)}}{\text{Flow (gal/min)}}$$

4. Enter the new K factor in the AquaLynx® Calibration Screen. The AquaLynx® should now display the proper flow.

