The Avista Black Box

Monitoring Device

Features:

- A stand alone device to monitor and simulate membrane system performance
- Developed for system design verification and troubleshooting
- Eliminates the need to sacrifice full sized elements for analysis
- Ideal for pilot testing and full scale system evaluation
- Autopsy results derived from the Black Box mirror those obtained from a full sized element

The Black Box is a stand-alone, self-contained reverse osmosis device. It is designed for use as an on-site tool to analyze RO system performance without having to interrupt the operation of the full scale system. The Black Box is configured to include the identical membrane used in the full system. The unit simulates the performance of the membrane closest to the sampling location with an overall recovery rate of approximately 0.5%. The Black Box is returned for autopsy and a diagnosis of membrane performance.

Connected to the system in several locations:

- **Feed**: to analyze the potential of:
  - colloidal fouling
  - biological fouling
  - organic fouling
  - supersaturated scale formers
  - oxidants (which can permanently damage membranes)
- **Inter-stage:**
  - Detect problems that are difficult to identify in the feed or concentrate
  - Find a unique inter-stage foulant deposit
- **Concentrate:**
  - Identify potential scale formers
  - Evaluate antiscalant performance
  - Test various and optimum recovery rates

Installation

The Black Box is self contained and designed to be maintenance-free. In the initial installation, the Black Box inlet is connected to a sample port on the RO system at the location where membrane performance will be monitored. The concentrate and permeate lines are connected to drain.

Easy to Use

The Black Box can be installed in minutes and additional units can be used to achieve multiple goals. Flows and conductivities can be measured and recorded to track membrane performance. Differential pressure is determined with the internal gauge and permeate conductivities can be measured to verify membrane performance.

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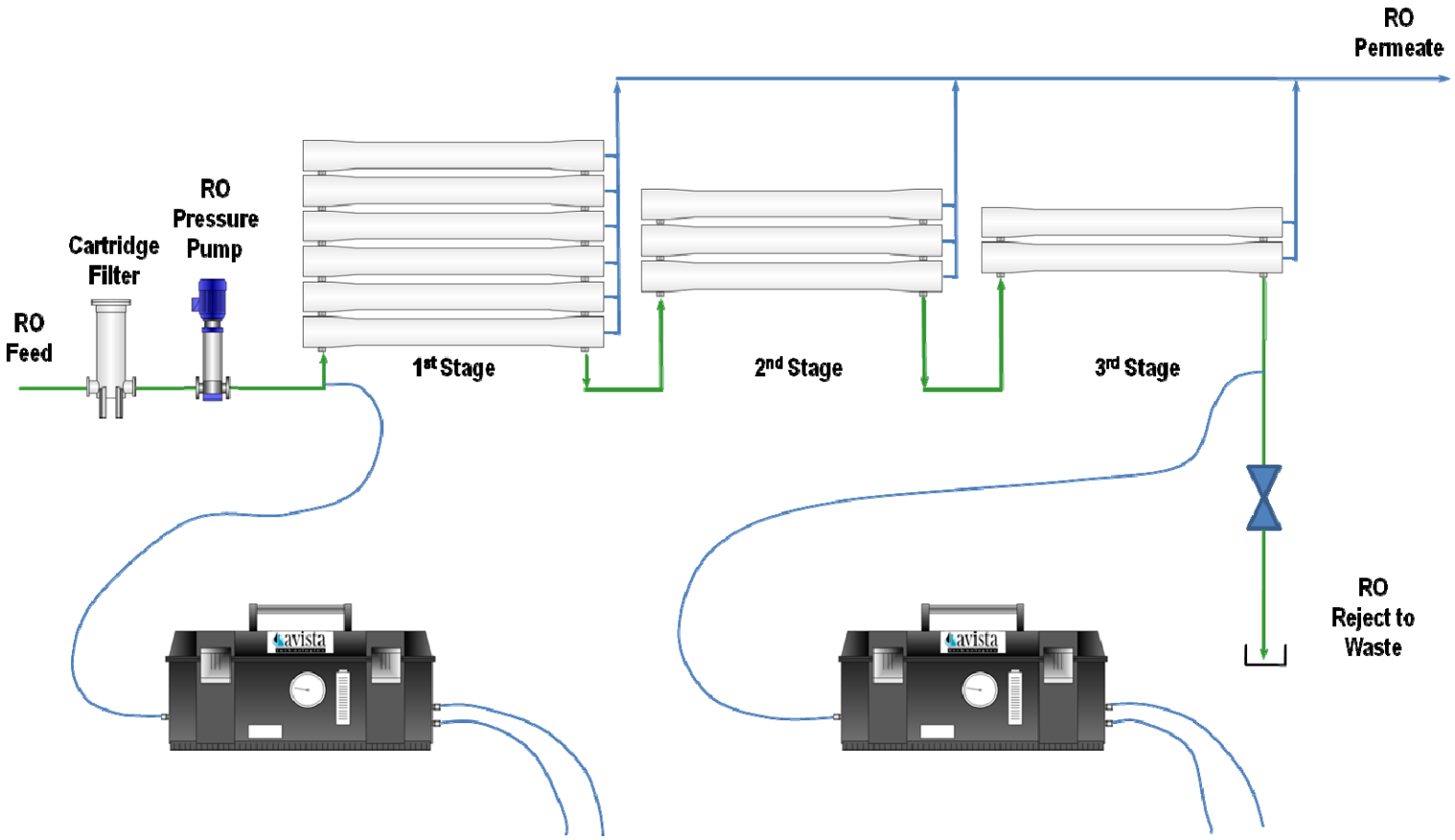
Typical Installation Locations for the Black Box:



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