

# Foxboro® Flow-Through Conductivity System for Greywater Processing

## Summary

Foxboro flow-through electrodeless conductivity sensors, together with Foxboro analyzers or transmitters, can measure from single unit  $\mu\text{S}/\text{cm}$  to 2000  $\text{mS}/\text{cm}$  for greywater contamination detection, and initiate the diversion of the unwanted product to waste.

## Business Value

With more than 40 years experience in measurement, Foxboro offers the most complete line of instrumentation available. The proven reliability and robustness of the Foxboro conductivity flow-through sensor and analyzers helps improve process performance, increases production yields and reduces equipment corrosion.



## The 871FT and 871 Sensors

The Foxboro® 871FT industrial flow-through conductivity sensor, together with an 876EC Series two-wire (dc) transmitter or an 875EC Series (ac) analyzer, provides rapid detection of contaminated greywater. Foxboro 871FT flow-through noninvasive electrodeless conductivity sensor can be vertically or horizontally adapted to your process by threaded or flanged end connections, and becomes a section of the process piping. It is available in line sizes from 0.5 to 4.0 inches and in a variety of construction materials to ensure process compatibility.

## Benefits

- On-Line sensor and analyzer diagnostics communicate real-time measurement fault
- Fast, easy and reliable calibration using calibration plug shirt pocket tool
- Savings and ease of use in installation, maintenance, replacement

## Technical Challenges

Desalination, the removal of salt from seawater to obtain fresh water, involves a process known as reverse osmosis (RO). Reverse osmosis uses pressure to force a solvent through an RO membrane that retains the solute on one side and permits passage of the solvent to the other side. The pressures required to force the solvent through the membrane from the high solute concentration to the low solute concentration side are 30 - 250 psi for fresh water and 600 - 1000 psi for seawater. Seawater has a natural osmotic pressure of 350 psi, which must be overcome. An RO membrane is a tightly packed, porous, water-permeable filter material typically housed in a small-diameter tube. Seawater RO membranes have a salt rejection rate of up to 99.8%.

Greywater, also known as sullage, is the wastewater generated by kitchens, laundries, bathing, and process operations, and can be as high as 50 - 80% of water consumption. Blackwater from biologicals and toxics comprising the balance is diverted to waste treatment. Smaller, less expensive RO membranes may be used to process recycled greywater at reduced pressures, and often 50 - 80% less expensive than primary desalination. However, unless contaminated greywater is identified and diverted, a return to the polishing system for subsequent purification can ruin sensitive RO membranes — resulting in costly replacements. Conductivity is well established and accepted as a viable, inexpensive, and reliable technology for rapid determination of greywater contamination.

### Foxboro

38 Neponset Avenue  
 Foxboro, Massachusetts 02035 USA  
 Toll free within the USA 1-866-764-6477  
 Global +1-508-549-2424

[www.fielddevices.foxboro.com](http://www.fielddevices.foxboro.com)

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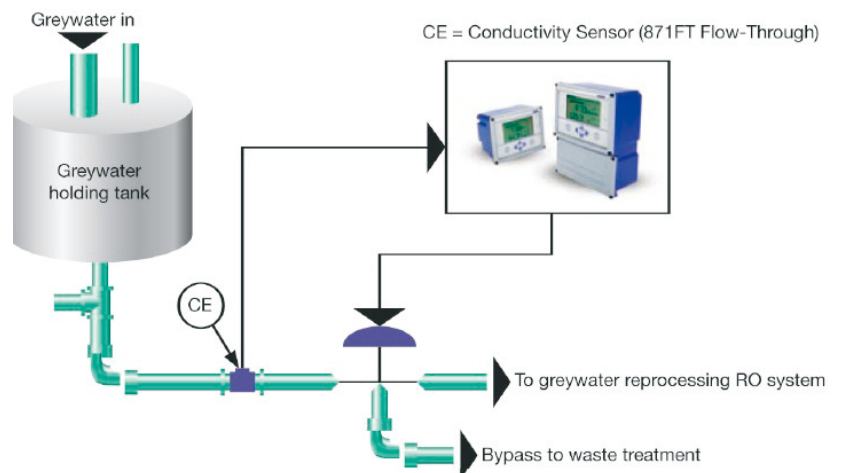
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## The 875EC Series Analyzer

The 875EC is a microprocessor-based, menu-driven ac-powered analyzer that provides a conductivity and/or temperature measurement indication and dual 4-20 mA isolated analog outputs. Two independent configurable alarm relays can be utilized to actuate diversion valves, alarms, or diagnostics. Commercial field versions are NEMA 4X and meet Class I, Division 2, Groups A, B, C, D hazardous location criteria. Ruggedized versions are MIL-SPEC qualified for shock and vibration, and MIL-SPEC 461-E qualified for EMI and RFI.

## Typical Users

- Energy drilling platforms
- Military and commercial cruise vessels
- Power generation
- General industry
- Desalination water treatment



## Product Model Code Recommendations

Item	Model Code	Description
1	875EC	Conductivity Analyzer, V ac
1a Opt	875EC Ruggedized	Conductivity Analyzer, V ac
2	876EC	Conductivity Transmitter, V dc
3	871FT	Conductivity Sensor Flow-Through
3a	871FT Ruggedized	Conductivity Sensor Flow-Through
4	EP485 Series	Conductivity Calibration Plug