Application Note
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Life Sciences

Tighter Conductivity Control in chromatography & purification systems

RESULTS

- Higher Purity and Production Yields
- Improved Throughput Production
- Ensures Thorough Cleaning Validation

"The elimination of piping dead legs with the direct insertion Model 245 design ensures that proper cleaning techniques have been thoroughly completed"

BACKGROUND

Biopharmaceutical Chromatography Systems are designed for separating and purifying proteins and bio-engineered products. Flow systems are compact in design to maximize throughput. No dead legs in process pipe can exist since unswept areas are more challenging to completely clean as well as delaying product throughput. The systems must maintain a hygienic design. Wetted surface finish must be < 20 µinch Ra and material traceability is important to maintain system integrity.

CHALLENGE

Conductivity measurement plays an important role in the purification process. Conductivity is one of the determinants of when to start and when to end the collection process. Tighter conductivity controls will increase purity yields. In addition, it may improve secondary collection processing.

Conductivity is a critical determining factor to determine cleanliness. Often, sensors that require tees or larger branches to be properly installed will create half filled process pipes, which lead to lower conductivity values. The conductivity sensors need to differentiate between CIP cleaning fluids and rinse water.

SOLUTIONS:

The PUR-SENSE™ Model 245 Flow Through Conductivity Sensor from Rosemount Analytical can accurately monitor the protein purification process. Improved accuracy can be achieved using FOUNDATION® Fieldbus Function Block Logic. The conductivity sensors can be optimized at the collection points and automatically switched at a predetermined conductivity value, therefore maximizing product yields.

Throughput is maximized using a sensor designed to eliminate dead legs and unswept pipes. The Model 245 Conductivity Sensor installs directly into the process piping via triclamp connections. There are no pressure drops for the installation. The direct flow-through design also ensures that conductivity is accurately measured in CIP phases. This design also ensures that the cleaning solutions make contact with all wetted components. Surface finish for end caps and liner are better than 16 µinch Ra.

The sensors can also differentiate between CIP solutions and rinse water. The sensor is made with FDA Compliant materials and wetted surfaces have a better than 16 µinch Ra finish. Temperature compensation can be achieved with an external RTD that can wire directly into the sensor junction box.

The Model XMT Intelligent Transmitter with FOUNDATION® Fieldbus works with the Model 245, as does the Model 1056. The 1056 has improved signal conditioning to allow a wider conductivity range with one sensor. The 1056 allows up to two sensor inputs, reducing cost and minimizing panel space. The 1056 has an optional PROFIBUS® digital communications output that can integrate with either a DCS or PLC. Another digital option is HART® Protocol that can optimize the sensor's performance when used with, Asset Management tools, such as AMS™ Intelligent Device Manager.

INSTRUMENTATION

PUR-SENSE™ Model 245 Flow Through Conductivity Sensor

- Highly accurate conductivity sensor
- Better than 16 micro inch Ra surface finish
- Direct insertion eliminates unswept process piping
- Documented Lot traceability on wetted components available

PUR-SENSE is a trademark of Rosemount Analytical.

Model XMT-FF Toroidal Conductivity Transmitter

- FOUNDATION Fieldbus with Function Block Logic (inside DCS)
- Easy to use menu structure
- Easy to read display

Model 1056 Conductivity Transmitter

- Large local operator interface
- Easy to use menu structure
- Improved signal conditioning
- PROFIBUS and HART Digital communications protocols available

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