

GE Healthcare uses Axetris Mass Flow Meters as calibration standard

Highest accuracy level for calibrating respiratory modules

GE Healthcare—a leading global medical technology and life sciences company—uses Axetris mass flow meters in the final flow measurement test for respiratory modules. The respiratory modules are a critical part of patient monitors used in life-critical situations in operating rooms worldwide. Axetris mass flow meters are based on MEMS thermal mass flow technology, which enables highest accuracy, eliminates sensor drift and has an extremely small pressure drop.

Respiratory modules for comprehensive patient monitoring

GE Healthcare's innovative respiratory modules support procedures in the operating room by providing essential data on inhaled and exhaled CO₂, O₂, N₂O, as well as anesthesia gases. The critical gases are measured using the sidestream method, whereby gas sensors rely on an integrated flow measurement sensor to provide a complete picture during medical procedures.

Axetris mass flow meter as a calibration standard

The integrated flow measurement sensors in GE Healthcare's respiratory modules undergo a rigorous calibration procedure. The final test of these flow sensors relies on the National Institute of Standards and Technology (NIST), traceable calibration on the Axetris mass flow meters.

Axetris mass flow meters themselves undergo an extremely detailed calibration at the Axetris facility in Central Switzerland. The mass flow meters are calibrated in a multi-stage process, which includes complete temperature compensation of the sensor output. The in-house MEMS thermal mass flow sensor combined with intelligent engineering also means that long-term drift of the mass flow meter is virtually negligible, making it a superior calibration standard.

Accuracy and Low Pressure Drop

Besides the high level of accuracy, the extremely low pressure drop of the Axetris mass flow meters means



The Axetris mass flow meter provides the required accuracy in flow measurement during production of respiratory modules used in life-critical medical procedures.

"We replaced the old flow meters with Axetris mass flow meters because of the high accuracy combined with good linearity and long-term stability. The mass flow meters are 'invisible' in the gas flow path, due to their low pressure drop."

Hannu K. S.

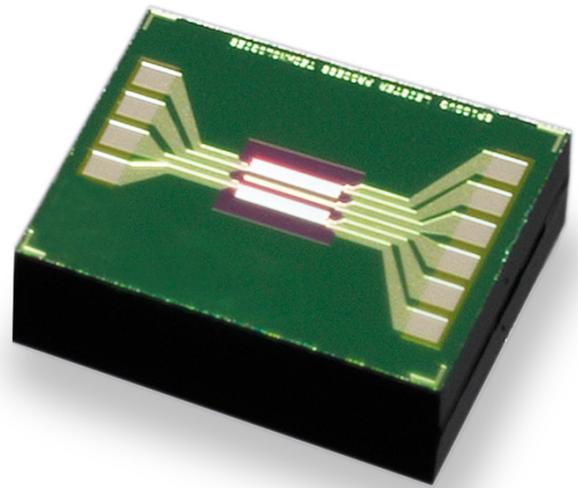
Engineering Manager—Gas Sensors
GE Healthcare

that pressure effects are completely eliminated during the final test.

All these features enable GE Healthcare's respiratory modules to achieve the highest performance standard in gas flow control, and eventually, in patient monitoring.

Performance benefits at a glance:

- ✓ Accuracy +/- 0.2% F.S. / +/- 1% O.R.
 whichever is greater
- ✓ Repeatability +/- 0.05% O.R.
 typically for Mass Flow Meters
- ✓ Dynamic Range > 1000:1
- ✓ Strict Calibration Procedure NIST Traceable Real Gas Calibration, full temperature compensation
- ✓ Reaction Time < 4 ms (mass flow sensor)
- ✓ Low Pressure Drop As low as 35 Pa (at 50 sccm flow)



The Axetris Mass Flow Technology uses the proprietary platinum based MEMS chip technology. The chip consists of a heating element and two highly sensitive temperature sensors.

About Axetris Mass Flow Meters and Controllers

Axetris offers OEM mass flow meters (MFM) and controllers (MFC) which offer outstanding value to the customer. The proprietary, platinum-based MEMS chip technology guarantees excellent accuracy and repeatability in combination with high speed and an extended dynamic range.

The Axetris mass flow technology is used by many leading companies in the fields of gas chromatography, leak testing, thermal analytics, mass spectroscopy, thin film deposition, plasma engineering



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