

High reproducibility and bidirectional flow measurement increase leak testing efficiency

High-precision leak testing with Axetris mass flow meters

Flow and pressure based leak testing is an integral part of the production process for a variety of industrial goods, ranging from automotive and industrial to medical parts. Axetris mass flow meters help to detect even the smallest leaks thanks to their extraordinary sensitivity, and they also help increase production efficiency due to an ultrafast response time of 4 ms. An additional asset is their capability for bidirectional flow measurement.

Leak testing is a standard procedure to examine leak integrity for a variety of industrial goods, e.g. automotive parts, industrial valves and medical devices, to name a few. Among a variety of leak testing techniques available on the market, such based on flow and pressure measurement are typically used to test for leaks upwards of 0.1 sccm (standard cubic centimeters per minute). There are two ways to measure a flow. Firstly, a mass flow sensor or a mass flow meter can be used directly to measure the mass flow of gas (typically industrial air or helium) escaping due to a leak. Secondly, the measurement can be conducted indirectly by supporting fill-up of the part to be tested, and subsequently measuring the drop of pressure (pressure decay testing).

Quick determination of stable conditions

Since leak testing is usually part of a standard quality assurance process in production, quick leak testing cycles are essential. A mass flow sensor that possesses a **quick reaction time** delivers the required efficiency. Additionally, the system or unit being tested needs to reach gas equilibrium (stable conditions) before a leak test can be correctly undertaken. For a quick determination of the stable state, **flow measurement in both directions** is required.

Why thermal mass flow measurement?

The MEMS thermal mass flow measurement principle offers a variety of application specific advantages. Due to the extremely low thermal mass of the basic mass flow measurement sensor in Axetris products, an industry-leading response time of 4 ms can be achieved. In addition, a very high reproducibility eliminates the need



Leak testing is a critical step in the production of a range of industrial products, Here: production of industrial valves

Axetris Advantages in Leak Testing Applications:

- ✓ Sensor response time of 4 ms
- ✓ Extremely high repeatability of typically < 0.05% O.R.
- ✓ Bidirectional flow measurement
- ✓ Low flow capability
- ✓ Miniscule pressure drop

for regular calibrations and delivers accurate leak test results over long periods.

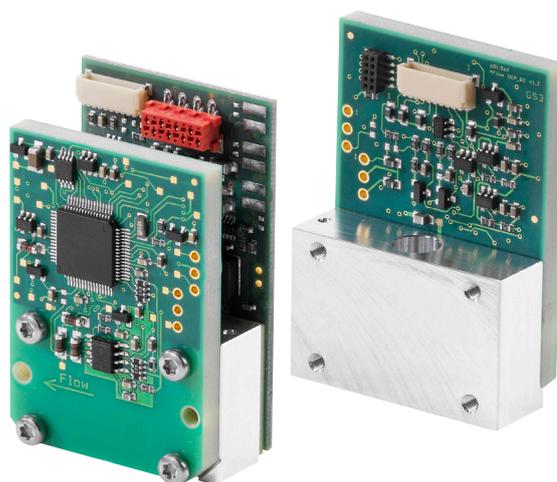
Axetris mass flow meters offer an unmatched dynamic range (>1000:1), helping customers operate across a wide range of flow values and down to very low mass flow rates. A miniscule pressure drop across the mass flow sensor eliminates any added system inaccuracy.

Axetris Mass Flow Meters – the right match for leak testing applications

Performance benefits at a glance:

- ✓ Repeatability +/- 0.05% O.R.
 typically for Mass Flow Meters
- ✓ Bidirectional Flow Available in two versions:
 - Symmetric +/-100% F.S.
 - Asymmetric +100%/-10% F.S.
- ✓ High Accuracy +/- 0.2% F.S. / +/- 1% O.R.
(Forward Direction) whichever is greater
- ✓ Pressure Drop 35 Pa@50sccm
- ✓ Dimensions 16.4 x 34 x 48.5 mm
(OEM Mass Flow Meter)
- ✓ Sensor Response < 4 ms

O.R.: Of Reading; F.S.: Full Scale
Typical values only, consult product datasheet for all product options



Now Available!
Bidirectional Flow Measurement

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 and more.



Contact

Headquarters

Axetris AG, Switzerland
 Schwarzenbergstrasse 10
 CH-6056 Kaegiswil
 Switzerland
 phone +41 41 662 76 76
 fax +41 41 662 75 25
 axetris@axetris.com
 www.axetris.com

USA

Leister Technologies LLC
 Itasca, IL 60143 I
 Fremont, CA 94538
 USA
 phone +1 844 293 8747
 fax +1 630 760 1001
 axetris.usa@axetris.com
 www.axetris.com

China

Leister Technologies Ltd.
 Building 11, 155 Yuanke Road
 Shanghai 201 109
 China
 phone +86 21 6442 2398
 fax +86 21 6442 2398
 axetris@axetris.cn
 www.axetris.cn

Japan

Leister Technologies KK
 Shinyokohama Bousei Bldg 1F
 3-20-12, Shinyokohama, Kohoku-ku
 Yokohama 222-0033 / Japan
 phone +81 45 447 36 37
 fax +81 45 477 36 38
 axetris@axetris.jp
 www.axetris.jp

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