

LFE - LAMINAR FLOW ELEMENTS

PRINCIPLES OF OPERATION



Flow of gas through a Laminar Flow Element generates a pressure difference between the upstream and the downstream pressure tap locations as shown in the cut-away view. This differential pressure is proportional to the flow velocity and viscosity of the gas, according to the Hagen-Poiseuille law.

As they have no moving parts, LFEs are inherently stable and repeatable. Calibration in our DKD ISO 17025 certified Flow Lab ensures the best possible overall accuracy. Flow range turndown up to 20:1 is possible with differential pressure linearly proportional to flow rate. These attributes make LFEs a great choice for gas flow measurement and flow control applications.

PERFORMANCE

Standard LFE calibration accuracy is $\pm 0.25\%$ OR (Of Reading) traceable to European and US National Institutes. Rigid construction and lack of any moving parts make the LFE calibration stable. Only physical damage or particulate deposition within the element will cause a calibration shift.

- **High Accuracy**
 - $\pm 0.25\%$ to $\pm 0.5\%$ of Reading, depending on calibration and DP device
 - Repeatability: 0.1%
- **Wide Rangeability**
 - Turndown: 20:1, depending on DP device
 - Sizes available to measure from 0.001 lpm to 5600 lpm of air flow at standard conditions.
 - Higher flowrates are possible.
- **Fast Response Time**
 - As fast as 10 ms, depending on DP device
- **Low Pressure Drop**
- **Multiple Gas Capability**
- **No Moving Parts to Wear Out**
- **LFE is 304/316 Stainless Steel**

APPLICATIONS

LFEs are suitable for use in most clean and non-condensing gas flow applications. They are ideal in critical gas flow measurement applications and make excellent calibration standards because of their inherent accuracy, stable calibration, excellent response time and repeatability.

To optimize the accuracy of Laminar Flow Elements, it is necessary to compensate for actual temperature and pressure of the gas flow stream. TrigasFI offers smart electronics, flow computers and software capable of performing all required corrections in real time.

Series 10, 11, 12 LAMINAR FLOW ELEMENTS

Full Scale FLOW	Series 10 DP=25 mBar	Series 11 DP=2.5 mBar	Series 12 DP=5 mBar
0.01 LPM	10-5-.01G*	11-5-.01G*	12-5-.01G*
0.03 LPM	10-5-.03G*	11-5-.03G*	12-5-.03G*
0.1 LPM	10-5-.1G*	11-5-.1G*	12-5-.1G*
0.3 LPM	10-5-.3G*	11-5-.3G*	12-5-.3G*
1.0 LPM	10-5-1G*	11-5-1G*	12-5-1G*
3.0 LPM	10-5-3G*	11-5-3G*	12-5-3G*
10.0 LPM	10-5-10G*	11-5-10G*	12-5-10G*
30.0 LPM	10-5-30G*	11-5-30G*	12-5-30G*
100 LPM	10-5-100G*	11-5-100G*	12-5-100G*
300 LPM	10-5-300G*	11-5-300G*	12-5-300G*
1000 LPM	10-5-1000G*	11-5-1000G*	12-5-1000G*

The Series 10, 11, and 12 Laminar Flow Elements are individually calibrated and ready to use with any differential pressure measuring device of suitable range.

FEATURES:

- Low cost
- High accuracy
- Volumetric (actual) & standard (mass) flow measurement
- LFE material 304/316 SS
- Rugged, no moving parts
- Low pressure drop
- Absolute pressure and Temperature probe port

OPTIONS:

- Higher accuracy
(consult factory)
- Multiple gas calibration

Flow rates to 5600 LPM available. Consult factory

* Specify gas: "A" (Air), "Arg" (Argon), "H" (Helium), "N" (Nitrogen), "J" (Oxygen), in place of "G". Consult factory for other gases or mixtures.

**Specify gas operating temperature and pressure when ordering.

***Consult factory for other flow rates, differential pressures, and other Technical Specs.