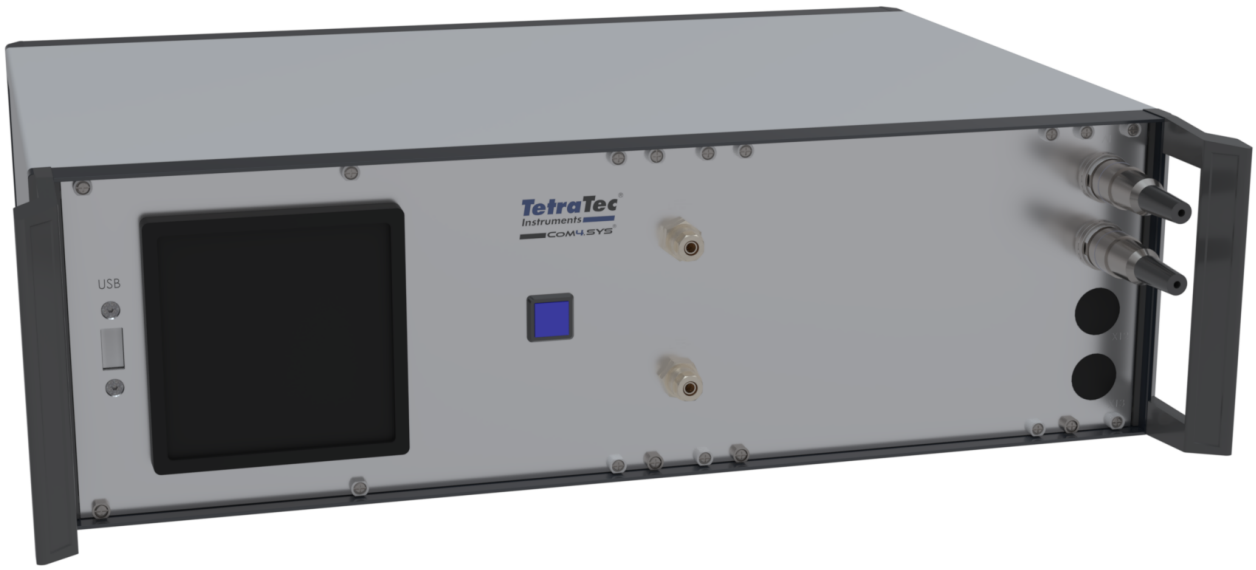
TetraTec Instruments



FLOW MEASUREMENT SYSTEM

CoM4.Flow-Eco/Smart/Pro

One evaluation unit for every laminar flow element

TETRATEC INSTRUMENTS GMBH · STEINENBRONN · GERMANY

01 — THE SYSTEM

One platform for every measuring section.

The evaluation unit does the actual measuring and computing: it stores the linearisations of more than ten laminar flow elements. When the measuring task changes, you simply change the element.

0.2 %
ACCURACY OF READING
Pro version with TetraTec LFE

> 10
CHARACTERISTIC CURVES
stored LFE linearisations

> 12
GASES
gas property database including air

THE ESSENTIALS

Free choice of laminar flow element

Laminar flow elements of the S and R series cover ranges from 1 mL/min to 64 m^3/min.

More than ten characteristic curves stored

The linearisations of the elements in use are held in the instrument. Changing an element is a selection, not a recalibration.

Test sequences in the instrument

The CoM4.SYS controller runs configured test programs by itself and supplies mean values and statistics for all measured variables.

Gas properties for more than twelve gases

Density, viscosity and Reynolds number are always computed in every cycle. Volumetric, mass and standard volumetric flow follow from the same measurement and, when further test gas conditions (pressure, temperature, humidity) are specified, also a reference volumetric flow converted to them.

Operation at the instrument or in the browser

4-inch touch display with apps for program and parameter selection, plus a browser interface with y/t graph and diagnostics*.

* The browser interface is intended primarily as a maintenance access and may not be approved for highly specific measuring applications. In that case, ask us about alternatives.

WHY THE MEASURING SECTION IS BETTER KEPT EXTERNAL

An instrument in which measuring section and evaluation are permanently joined covers exactly one range; the next range needs a second instrument and a second computing unit. Here the evaluation unit stays the same, and changing the element changes only the measuring range, from millilitres up to 64 m^3/min and beyond on request.

Operating principle

The evaluation unit primarily measures the quantities from which the flow is calculated: differential pressure across the laminar flow element, absolute pressure, temperature and, on request, humidity. A microcontroller uses up-to-date physical models to compute the actual volumetric flow, the standard or reference volumetric flow, or the mass flow.

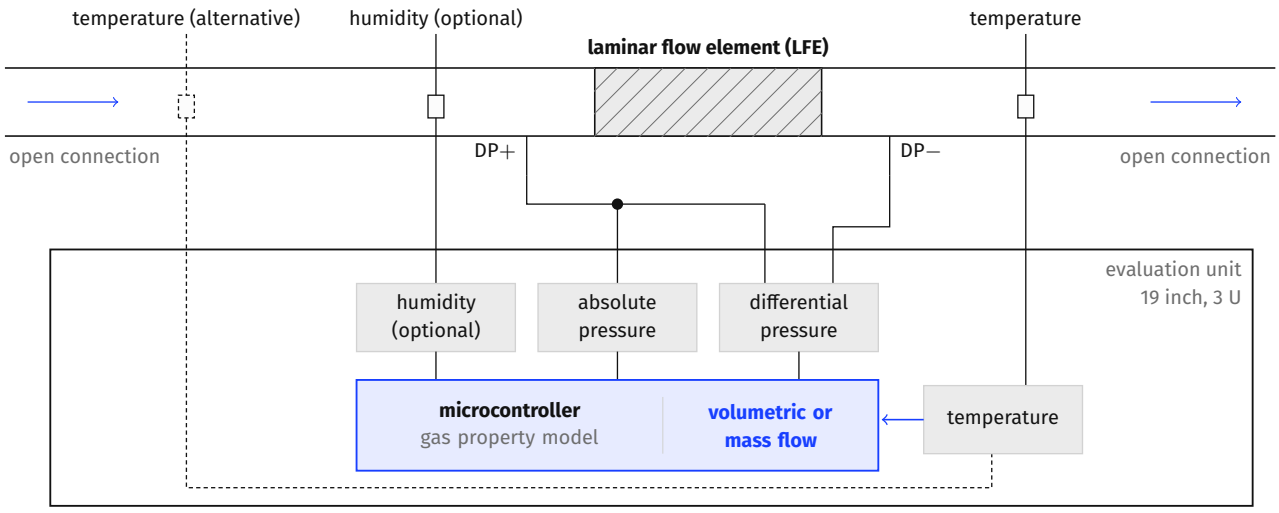
The calculation follows the linear relationship according to Hagen-Poiseuille or the UniFlow method adapted by TetraTec, which also includes the density in the linearisation and is used above all at higher pressures.

THE SIX VERSIONS

VERSION	ACCURACY	MEASUREMENT UNCERTAINTY	DIFFERENTIAL PRESSURE	ABSOLUTE PRESSURE
Eco-LP-01	< 0.3 % rdg.	±1.5 % rdg.	2 to 20 mbar	0.8 to 1.2 bar
Eco-HP-01	< 0.3 % rdg.	±1.5 % rdg.	2 to 20 mbar	0.8 to 4 bar
Smart-LP-01	< 0.25 % rdg.	±1 % rdg.	2 to 20 mbar	0.8 to 1.2 bar
Smart-HP-01	< 0.25 % rdg.	±1 % rdg.	2 to 20 mbar	0.8 to 7 bar
Pro-LP-01	< 0.2 % rdg.	±0.65 % rdg.	2 to 60 mbar	0.8 to 1.2 bar
Pro-HP-01	< 0.2 % rdg.	±0.65 % rdg.	2 to 60 mbar	0.8 to 7 bar

rdg. = of reading. The measurement uncertainty is stated with a coverage factor $k = 2$. Accuracy and measurement uncertainty apply to the chain of evaluation unit and any TetraTec laminar flow element, each over a turndown ratio of 1:10, and to air only. Eco, Smart and Pro differ in the accuracy class and in the pressure sensors, LP and HP in the permissible absolute pressure. The flow range itself depends on the connected laminar flow element.

MEASURING CHAIN



TYPICAL APPLICATIONS

- Quality assurance in production lines
- Calibration of flow and pressure sensors
- Development and testing of gas and air components
- Monitoring and analysis of process gas flows
- Leak and functional testing
- Comparative measurements in the laboratory

> *Accuracy you can build on: the reliable basis for your quality assurance.*

02 — DESIGN

The measuring task first, then the element.

VERSIONS

- Six versions: Eco, Smart and Pro, each as LP and HP
- Smart with the TetraTec PDP2 pressure sensors
- Desktop or rack enclosure, with or without handles
- Sensor connections on the front or the rear
- Humidity measurement for the smaller measurement uncertainty

ACCESSORIES

- Laminar flow elements of the S and R series
- Factory or DAkkS calibration certificate

KEY SPECIFICATIONS

Flow rate (per element)	**1 mL/min to 64 m³/min**
Higher flow rates	**on request**
Accuracy Eco	**< 0.3 % of reading**
Differential pressure Eco	**2 to 20 mbar**
Absolute pressure Eco	**0.8 to 1.2 bar (LP), 0.8 to 4 bar (HP)**
Accuracy Smart	**< 0.25 % of reading**
Differential pressure Smart	**2 to 20 mbar**
Absolute pressure Smart	**0.8 to 1.2 bar (LP), 0.8 to 7 bar (HP)**
Accuracy Pro	**< 0.2 % of reading**
Differential pressure Pro	**2 to 60 mbar**
Absolute pressure Pro	**0.8 to 1.2 bar (LP), 0.8 to 7 bar (HP)**
Power supply	**90 to 260 VAC, max. 80 W**
Temperature	**5–50 °C**
Humidity	**5–90 % RH (optional)**
Process connection	**Union nuts 4/6 mm**
Interface	**Ethernet, USB 2.0**
Enclosure	**462 × 148 × 316 mm, 3 U**

Complete data in the technical datasheet.

FROM ENQUIRY TO RECURRING CALIBRATION

1. **Record the measuring task**
   Measuring range, type of gas, test volume, cycle time and operating conditions – the design follows from these.
2. **Design and calibrate the instrument**
   Assembly, calibration in our own accredited laboratory, calibration certificate with stated uncertainty.
3. **Integrate and support**
   Integration into your production, training and the recurring calibration at the agreed interval.

We select the element for your measuring task.

REQUEST A DESIGN

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