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# EP LMF® - LaminarMasterFlow®

## High-precision flow measurement of gas and air

**Brochure EPE-160797**

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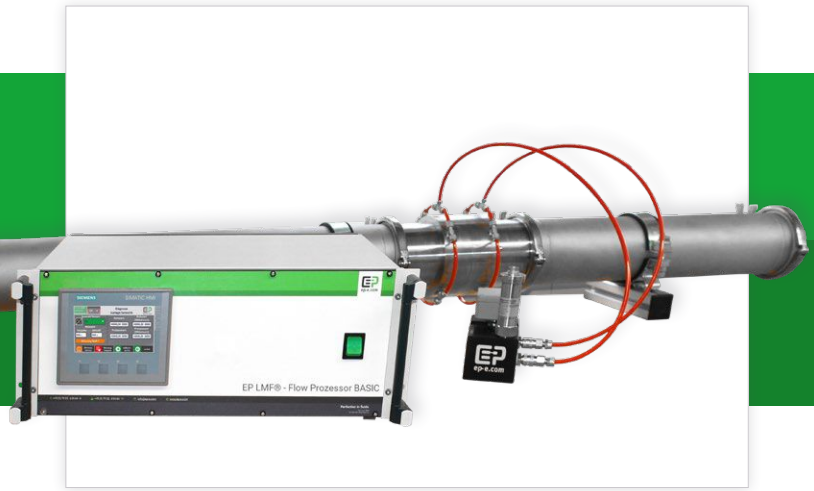


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## Flow measurement system for gas and air

Flow rates up to 700 m³/h (opt. 4000 m³/h)
Variable system configuration
Rapid and precise measurement

## Description

The EP LMF® - LaminarMasterFlow® is a complete system for high-precision flow measurement of gas and air (volume and mass flow). The LMF® system consists of a flow processor, a Laminar Flow Element (LFE) as measuring section, a cable set and a sensor set.

## Variable system configuration

Different types of flow processors, diverse measurement accuracies, a big range of Laminar Flow Elements in different sizes and some options can be selected application specific and allow a variable system configuration.

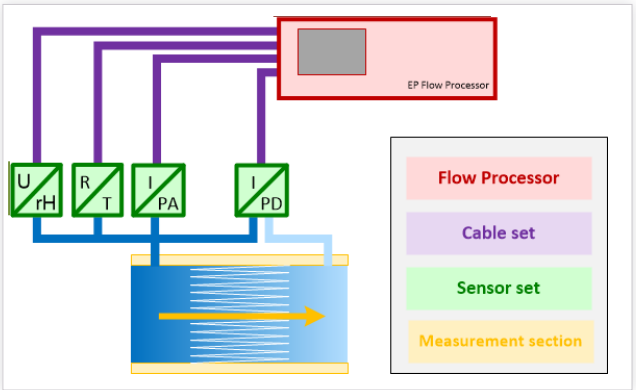
## Rapid and precise measurement

Calculation of the measurement values as mass flow, nominal volume flow and current volume flow is done automatically in the flow processor. Depending on the type of processor, measurement values can be displayed, data can be exported via interface or saved and processed directly on the PC.
Measurement accuracy can be selected with the system configuration and lies between 1.0 and 0.5 % MV.

## Easy use

The intuitive user interface leads the user through the test procedures, allows the generation of different user accounts and offers the possibility to calibrate the measurement sensors via the processor.

## Technical diagram
EP LMF® - LaminarMasterFlow® System




## Standard solutions
Application examples

- Gas and flow technology:
  Calibration gas meters, MFM, MFC, LFE, venturi nozzles
- Automotive and automation:
  Measurement of valves, actuators, flowmeters, HFM, leakage measurement on car tanks
- House and energy tech.:
  Blower test bench, testing of extractor hoods, ventilation systems, etc.
- Valve technology:
  Characteristic curve determination for valves
- Filter technology:
  Characteristic curve determination for filters
- Pharma und medicine:
  Inhaler test, testing of air samplers

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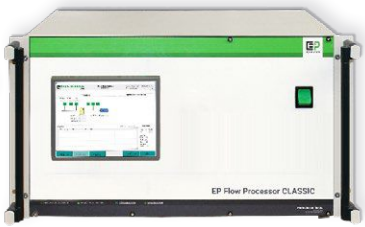
# Flow Processor

## Flow Processor

- ✓ Convenient 19” rack
- ✓ Intuitive use interface
- ✓ Three types of processors

The Flow Processor controls the test procedure and the data logging and analysis. For different application requirements three processor types are available (BASIC, STANDARD and CLASSIC).

BASIC / STANDARD



CLASSIC

| BASIC | STANDARD | CLASSIC |
|---|---|---|
| For SPS based applications | For SPS based applications | Stand-alone applications in the lab or industry |
| Siemens control system | Siemens control system | PC control system |
| Measurement accuracy depending on sensor set up to<br>- 0.8 % MV + 0.05 % EV or<br>- 1.0 % MV + 0.1 % EV | Measurement accuracy depending on sensor set up to<br>- 0.8 % MV + 0,05 % EV or<br>- 1.0 % MV + 0.1 % EV | Measurement accuracy up to 0.5 % MV + 0.025 % EV |
| Display of measurement values | Display of measurement values, export and saving via USB, webserver for remote control | Display of measurement values, export and saving via USB, several measurement sections selectable |

# Laminar Flow Elements

## Laminar Flow Elements (LFE)

- ✓ High measurement accuracy
- ✓ Wide measurement range
- ✓ Low pressure loss

Flow is measured via Laminar Flow Elements (LFE), which are available in different sizes covering a total measurement range from 0.01 to 700 m³/h.
(Optional up to 4000 m³/h)

TC10

TC40

TC150

### Overview available LFEs

| LFE | Flow [m³/h] |
|---|---|
| LFE EPM TC10-1 | 0.012...0.12 |
| LFE EPM TC10-2 | 0.03...0.3 |
| LFE EPM TC10-3 | 0.06...0.6 |
| LFE EPM TC10-4 | 0.12...1.2 |
| LFE EPM TC10-5 | 0.27...2.7 |
| LFE EPM TC20 | 0.69...6.9 |
| LFE EPM TC25 | 1.14...11.4 |
| LFE EPM TC40 | 4.2...42 |
| LFE EPM TC50 | 7.11...71.1 |
| LFE EPM TC80 | 16.8...168 |
| LFE EPM TC100 | 28.0...280 |
| LFE EPM TC150 | 67.8...678 |

Laminar Flow Elements (LFE) are flow sensors that work according to the differential pressure principle. Due to the laminar flow in the capillaries of the LFE there is (according to Hagen-Poiseuille) a nearly linear correlation between flow and resulting differential pressure. In contrast to other non-linear differential pressure principles, LFEs could realize a wide measurement range up to 1:100 (with the appropriate calibration). High measurement accuracy up to 0.5 % MV, low pressure loss of 20 mbar and rapid reaction times complete the benefits of this measurement section.

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# Ordering Code

| EP LMF®-LaminarMasterFlow® Ordering Code: | 159733_ | X | X | X | X |
|---|---|---|---|---|---|
| **Flow Processor** | | | | | |
| BASIC measurement accuracy 1.0 % MV + 0.1 % EV | | 1 | | | |
| BASIC measurement accuracy 0.8 % MV + 0.05 % EV | | 2 | | | |
| STANDARD measurement accuracy 1.0 % MV + 0.1 % EV | | 3 | | | |
| STANDARD measurement accuracy 0.8 % MV + 0.05 % EV | | 4 | | | |
| CLASSIC measurement accuracy 0.5 % MV + 0.025 % EV | | 5 | | | |
| **Measuring section - Laminar Flow Element (LFE)*** | | | | | |
| LFE EPM TC10-1 | | | A | | |
| LFE EPM TC10-2 | | | B | | |
| LFE EPM TC10-3 | | | C | | |
| LFE EPM TC10-4 | | | D | | |
| LFE EPM TC10-5 | | | E | | |
| LFE EPM TC20 | | | F | | |
| LFE EPM TC25 | | | G | | |
| LFE EPM TC40 | | | H | | |
| LFE EPM TC50 | | | I | | |
| LFE EPM TC80 | | | J | | |
| LFE EPM TC100 | | | K | | |
| LFE EPM TC150 | | | L | | |
| **Calibration of the measuring section** | | | | | |
| Factory calibration | | | | 1 | |
| DAkkS calibration | | | | 2 | |
| **Cable set** | | | | | |
| 2.5 m | | | | | M |
| 5 m | | | | | N |
| 10 m | | | | | P |
| 15 m | | | | | Q |

## Operating conditions

Operating temperature: 0°C - 50°C
Operating pressure (abs): atmospheric (opt. up to 10 bar)
Operating medium: air, gas
Medium supply (option)
Measurement instrumentation for test unit (option)

**You cannot find the perfect item for your application? You need in addition to the LMF® system further options, e.g. a medium supply? Please let us know. We would be pleased to send you a quote according to your individual requirements.**

*) Base plate / frame for measuring section on request according to customer demands.

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