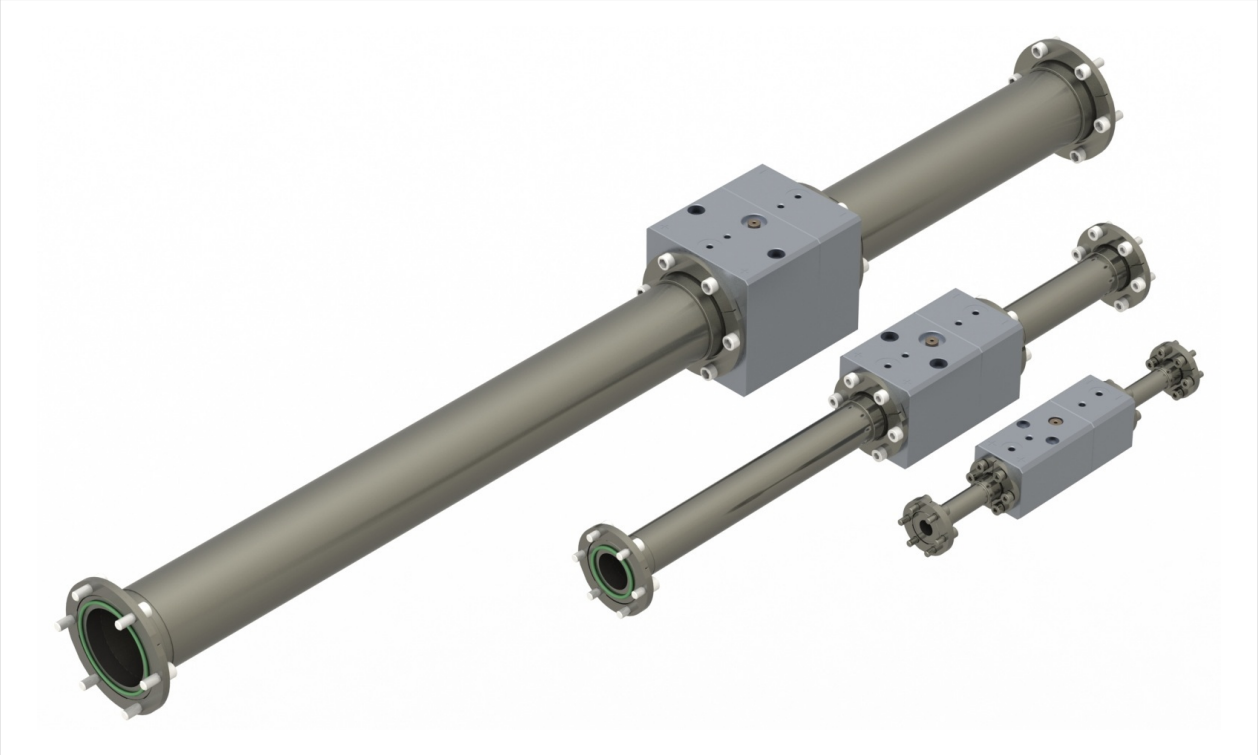
LFE S

Technical Datasheet



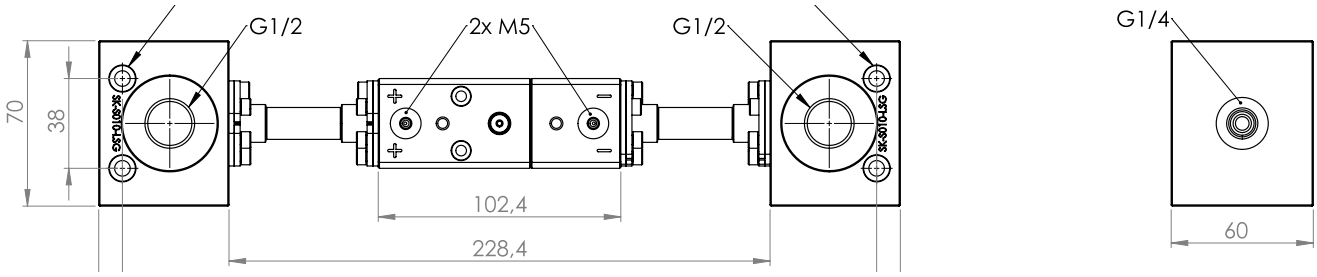
Short description

Laminar flow element in block design for measuring medium and small flows of air and gases. The LFE works as a differential pressure element: a laminar flow forms in its capillary matrix, and its differential pressure is proportional to the volumetric flow according to the Hagen-Poiseuille law. Compared with Venturi tubes and orifice plates, the usable measuring span is about three times as large for the same differential pressure sensor. With six sizes the S series covers 0.001 to 990 L/min.

Special features

- Compact and light, O-ring-sealed and provided with ring pressure taps
- Housing aluminium 3.2315, seals PTFE and FPM
- Connection adapter stainless steel 1.4404, pressure rating: 11 bar
- Greatly extendable measuring span: turndown up to 1:50 with the borosilicate glass multi-capillaries (LFE S010, up to 10 L/min), up to 1:20 with the stainless steel matrices – beyond that on request.

LFE S010

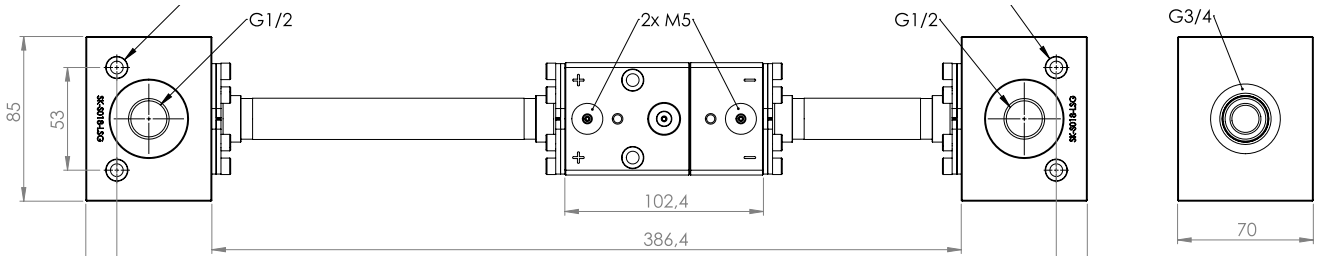


Dimensions of the LFE S010 – Dimensions in millimetres. Drawing not to scale; binding dimensions on request.

Calibratable flow range	0.001 to 10 L/min (referred to air at 1000 mbar, 20 °C, 0 % RH)
max. turndown ratio	1:50 (air only)
Matrix material	Borosilicate glass multi-capillary
Accuracy (linearity deviation)	< 0.2 % rdg.
Hysteresis	+/- 0.1 % rdg.
Repeatability	< 0.1 % rdg.
Long-term stability (1 year)	< 0.5 % rdg.
smallest stated measurement uncertainty (k=2) after calibration	0.45 % rdg.
Housing material	Aluminium 3.2315
Seals	PTFE and FPM
Operating temperature	5 to 70 °C (non-condensing range)
Type of gas	Air, inert gases, CO_2, oxygen*, hydrogen*, CO* other gases on request
Weight	up to 3 kg
Pressure rating	2.5 bar differential pressure, 11 bar absolute pressure
Mounting position	any
Intrinsic leakage (He leak)	$< 1 \times 10^{-6}$ mbar L/s

rdg. = of reading, FS = full scale. The flow data refer to air; other gases have different measuring ranges, which we state on request.
* on request and subject to the Pressure Equipment Directive 2014/68/EU.

LFE S018

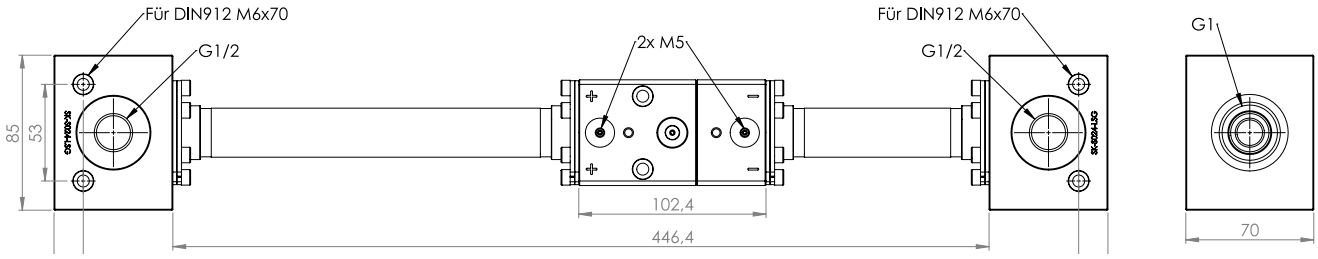


Dimensions of the LFE S018 – Dimensions in millimetres. Drawing not to scale; binding dimensions on request.

Calibratable flow range	approx. 10 to 150 L/min (referred to air at 1000 mbar, 20 °C, 0 % RH)
max. turndown ratio	1:20 (air only), beyond on request
Matrix material	Stainless steel matrix
Accuracy (linearity deviation)	$<$ 0.3 % rdg.
Hysteresis	+/- 0.15 % rdg.
Repeatability	$<$ 0.1 % rdg.
Long-term stability (1 year)	$<$ 0.5 % rdg.
smallest stated measurement uncertainty (k=2) after calibration	0.40 % rdg.
Housing material	Aluminium 3.2315
Seals	PTFE and FPM
Operating temperature	5 to 70 °C (non-condensing range)
Type of gas	Air, inert gases, CO_2, oxygen*, hydrogen*, CO* other gases on request
Weight	up to 4 kg
Pressure rating	2.5 bar differential pressure, 11 bar absolute pressure
Mounting position	any
Intrinsic leakage (He leak)	$< 1 \times 10^{-6}$ mbar L/s

rdg. = of reading, FS = full scale. The flow data refer to air; other gases have different measuring ranges, which we state on request.
* on request and subject to the Pressure Equipment Directive 2014/68/EU.

LFE S024

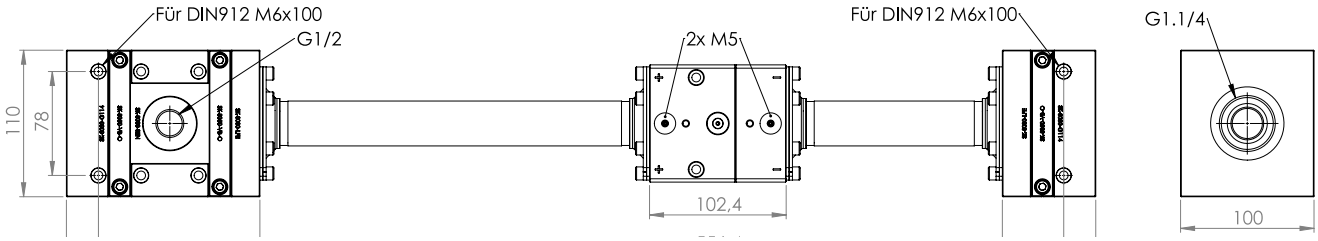


Dimensions of the LFE S024 – Dimensions in millimetres. Drawing not to scale; binding dimensions on request.

Calibratable flow range	approx. 16 to 260 L/min (referred to air at 1000 mbar, 20 °C, 0 % RH)
max. turndown ratio	1:20 (air only), beyond on request
Matrix material	Stainless steel matrix
Accuracy (linearity deviation)	< 0.3 % rdg.
Hysteresis	+/- 0.15 % rdg.
Repeatability	< 0.1 % rdg.
Long-term stability (1 year)	< 0.5 % rdg.
smallest stated measurement uncertainty (k=2) after calibration	0.40 % rdg.
Housing material	Aluminium 3.2315
Seals	PTFE and FPM
Operating temperature	5 to 70 °C (non-condensing range)
Type of gas	Air, inert gases, CO_2, oxygen*, hydrogen*, CO* other gases on request
Weight	up to 4 kg
Pressure rating	1.5 bar differential pressure, 11 bar absolute pressure
Mounting position	any
Intrinsic leakage (He leak)	$< 1 \times 10^{-6}$ mbar L/s

rdg. = of reading, FS = full scale. The flow data refer to air; other gases have different measuring ranges, which we state on request.
* on request and subject to the Pressure Equipment Directive 2014/68/EU.

LFE S030

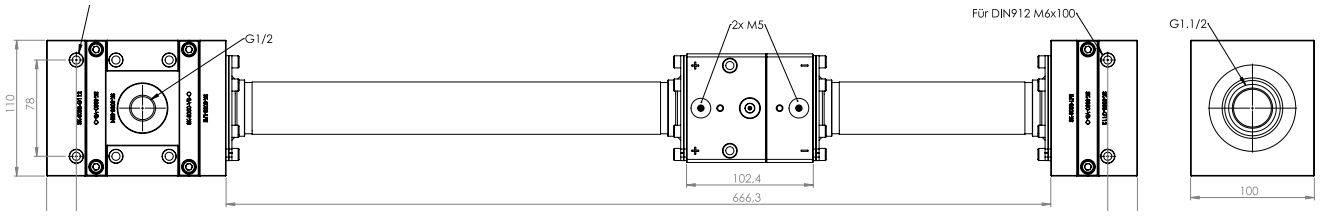


Dimensions of the LFE S030 – Dimensions in millimetres. Drawing not to scale; binding dimensions on request.

Calibratable flow range	approx. 24 to 350 L/min (referred to air at 1000 mbar, 20 °C, 0 % RH)
max. turndown ratio	1:20 (air only), beyond on request
Matrix material	Stainless steel matrix
Accuracy (linearity deviation)	< 0.3 % rdg.
Hysteresis	+/- 0.15 % rdg.
Repeatability	< 0.1 % rdg.
Long-term stability (1 year)	< 0.5 % rdg.
smallest stated measurement uncertainty (k=2) after calibration	0.40 % rdg.
Housing material	Aluminium 3.2315
Seals	PTFE and FPM
Operating temperature	5 to 70 °C (non-condensing range)
Type of gas	Air, inert gases, CO_2, oxygen*, hydrogen*, CO* other gases on request
Weight	up to 4 kg
Pressure rating	1 bar differential pressure, 9 bar absolute pressure
Mounting position	any
Intrinsic leakage (He leak)	$< 1 \times 10^{-6}$ mbar L/s

rdg. = of reading, FS = full scale. The flow data refer to air; other gases have different measuring ranges, which we state on request.
* on request and subject to the Pressure Equipment Directive 2014/68/EU.

LFE S038

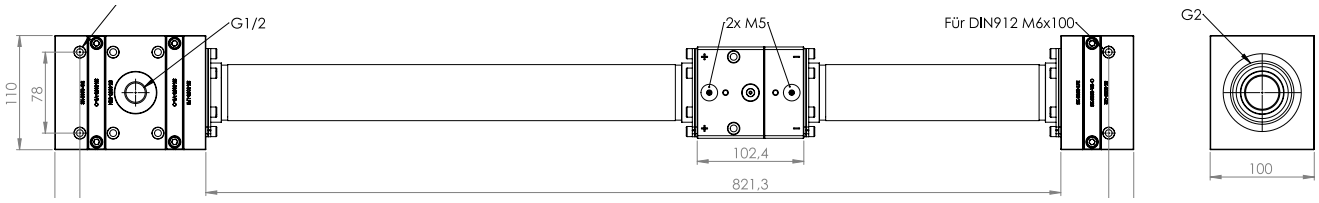


Dimensions of the LFE S038 – Dimensions in millimetres. Drawing not to scale; binding dimensions on request.

Calibratable flow range	approx. 38 to 500 L/min (referred to air at 1000 mbar, 20 °C, 0 % RH)
max. turndown ratio	1:20 (air only), beyond on request
Matrix material	Stainless steel matrix
Accuracy (linearity deviation)	$<$ 0.3 % rdg.
Hysteresis	+/- 0.15 % rdg.
Repeatability	$<$ 0.1 % rdg.
Long-term stability (1 year)	$<$ 0.5 % rdg.
smallest stated measurement uncertainty (k=2) after calibration	0.40 % rdg.
Housing material	Aluminium 3.2315
Seals	PTFE and FPM
Operating temperature	5 to 70 °C (non-condensing range)
Type of gas	Air, inert gases, CO_2, oxygen*, hydrogen* other gases on request
Weight	up to 6 kg
Pressure rating	0.75 bar differential pressure, 7 bar absolute pressure
Mounting position	any
Intrinsic leakage (He leak)	$< 1 \times 10^{-6}$ mbar L/s

rdg. = of reading, FS = full scale. The flow data refer to air; other gases have different measuring ranges, which we state on request.
* on request and subject to the Pressure Equipment Directive 2014/68/EU.

LFE S050



Dimensions of the LFE S050 – Dimensions in millimetres. Drawing not to scale; binding dimensions on request.

Calibratable flow range	approx. 70 to 990 L/min (referred to air at 1000 mbar, 20 °C, 0 % RH)
max. turndown ratio	1:20 (air only), beyond on request
Matrix material	Stainless steel matrix
Accuracy (linearity deviation)	< 0.3 % rdg.
Hysteresis	+/- 0.15 % rdg.
Repeatability	< 0.1 % rdg.
Long-term stability (1 year)	< 0.5 % rdg.
smallest stated measurement uncertainty (k=2) after calibration	0.40 % rdg.
Housing material	Aluminium 3.2315
Seals	PTFE and FPM
Operating temperature	5 to 70 °C (non-condensing range)
Type of gas	Air, inert gases, CO_2, oxygen*, hydrogen* other gases on request
Weight	up to 8 kg
Pressure rating	0.5 bar differential pressure, 5 bar absolute pressure
Mounting position	any
Intrinsic leakage (He leak)	$< 1 \times 10^{-6}$ mbar L/s

rdg. = of reading, FS = full scale. The flow data refer to air; other gases have different measuring ranges, which we state on request.
* on request and subject to the Pressure Equipment Directive 2014/68/EU.

Ordering information

The LFE is available in a wide variety of variants. The following information is required for ordering:

- Measuring range
- All gases used and the maximum operating pressure
- Process connections

FURTHER INFORMATION

Benefits, operating principle and application examples are given in the product brochure **LFE S-Serie**. To discuss your measuring task, contact us at **+49 7157 5387-0** or **info@tetratec.de**.