Speed Pressure Flow Rate Temperature

Compact-Fluidstor Gas Flowmeter LRM-SF2

for measuring all technical and medical gases

The flow-sensor is designed as a hot wire sensor. It measures the oscillation frequency in a 2-chamber-system. The oscillations are produced by reciprocating stream in a U-shaped channel, which connects the two chambers.

- Compact device made of stainless steel 1.4571
- Certified for medical gases
- Insensibility to dirt, e.g. oil and rust residues in compressed-air systems
- Adjusting range 1:100
- Low pressure loss
- Short response time T90 ≤ 100 ms
- High accuracy (± 1,5 % of true value)
- Max. temperature 120°C, pressure 16 bar
- Ex-certification acc. to ATEX (Ex II 1 G E E x i a II C T 4)

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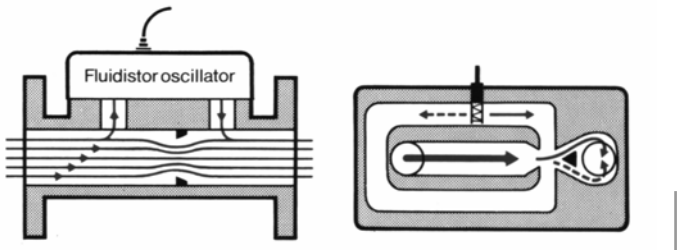
Principle of measurement

The meter is a fluidistor oscillator with an oscillating frequency which is directly proportional to the gas passing through it.

The frequency / velocity ratio is constant for all gases within a large flow range. The volume per pulse is not affected by changes in gas density and viscosity.

The fluidistor works as a bypass to the main housing. The main flow is throttled by an orifice plate, thus creating the same flow coefficient as in the fluidistor. The flow through the fluidistor is a specific portion of the total flow through the meter. As there is a fixed ratio between these two flows, the oscillating frequency of the fluidistor is the measurement of the total flow through the meter.



The right hand picture shows a cross section of the fluidistor. The gas flow enters the meter on the left and leaves it through the connection to the right.

The flow choses alternately one of the two channels directly upstream of the outlet. The occuring oscillation is caused by the reciprocating flow within the U-shaped channel connecting the control channels.

The oscillating frequency is measured in the U-shaped channel by a hot wire sensor. The sensor can easily be replaced without removing the meter and does not cause a recalibration of the meter.

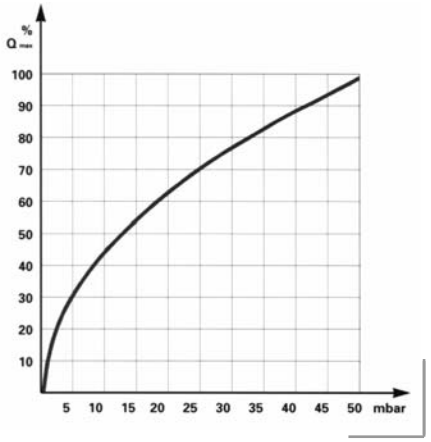
In the signal converter, the oscillations are amplified to a pulse or analogue signal to be received by a counter, a recorder or an indicating instrument.

Pressure loss / Pressure flow

The diagram applies to gases of air density at NTP, i.e. 0°C and 1000 mbar.

The decrease of pressure is always proportional to the gas density.

If the operating pressure should rise by 100%, the pressure drop will also be double.



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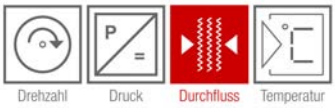


Measuring accuracy

The density (actually viscosity) of the gas influences the accuracy at low flow rates.

Above the limit value Qt the accuracy is ± 1,5% of the measuring value.

Below Q_t the accuracy is ±5% of the measuring value.

Example

At a density of X kg/m³ the limit value is
Q_t = X % von Q_{max}.

Density		Limit value Q_t
0,5 kg/m³	=	16 %
1,0 kg/m³	=	8 %
2,0 kg/m³	=	4 %
4,0 kg/m³	=	2 %
8,0 kg/m³	=	1 %

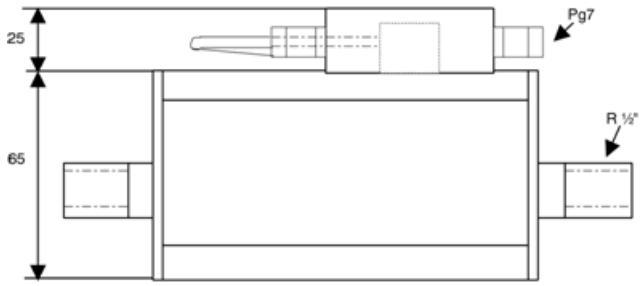
Technical Data

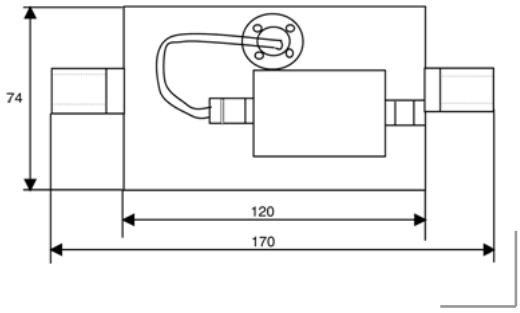
Material	1.4571
Process connection	R ½
Measuring range	Q = 3,5 - 280 l/min Q = 0,21 - 16,8 m³/h
Accuracy	± 1,5% of true value
Repeat accuracy	0,1% of true value
Max. pressure	16 bar (rel)
Setting time	at 50% Q_{max} = 3 Sek. at 70% Q_{max} = 5 Sek. at 100% Q_{max} = 10 Sek.
Pressure loss	at 25 l/min = 2 mbar at 100 l/min = approx. 7 mbar at 200 l/min = approx. 25 mbar

Mounting instruction

In order to avoid measuring value corruption, the inlet-zone requires 10 x DN (R 1/2") and the outlet-zone 5 x DN (R 1/2"). A direct reduction from DN 32 to (R 1/2") ist not permissible.

Maßbild





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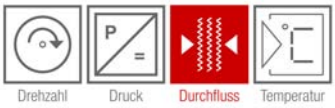

Evaluation Unit

Flow Rate Correction Calculator GDR 1403 for all technical and medical gases

The Flow Rate-Correction Calculator detects the impulse signals of up to two fluidistor gas flow meters GD 100 using 1 or 2 channels. According to the assignment it converts the impulse signals into m³/h or Nm³/h. The actual flow rate is displayed in m³/h resp. Nm³/h or quantity in m³ resp. Nm³ on the LCD-display.

The device has following options:

- Integrated recorder to log measured values in the ring buffer (1 GB) for fast identification of faults during operation
- Saving logged data in external SQL-database using the configuration software EstersConfig
- Visualisation of data in time series using the configuration software EstersConfig
- Integration into IT-networks via Ethernet TCP/IP
- Data transfer via PROFIBUS-DP, Modbus-RTU, Modbus-TCP, Ethernet/IP

For further information see datasheet DS 303 E.

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Ordering information

A)	Minimum flow rate (m³/h)
B)	Maximum flow rate (m³/h)
C)	Medium, e.g. wet biogas
D)	Nominal width DN (e.g. DN50)
E)	Operating pressure (bar)
F)	Operating temperature (°C)
G)	Maximum pressure loss (mbar)
H)	Display in Nm³/h or m³/h
I)	4 - 20 mA and impuls output
J)	BUS-output, e.g. PROFIBUS-DP, Modbus-RTU, instead of mA-output

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