Speed | Pressure | Flow Rate | Temperature

GAS-VALIDATION-FLOWMETER "ECOFLOW 2"

for the measurement of all technical and medical gases

Rev.-Nr.: DS 301 E V 0.5 2009-08-18

- Measuring range 0,1 - 200 NL/min
- Compact structure without moving parts
- Unique sensor, complete stainless steel AISI 316
- In connection with a flow rate calculator (Ethernet-interface) for validation of costs of compressed air respectively oxygen

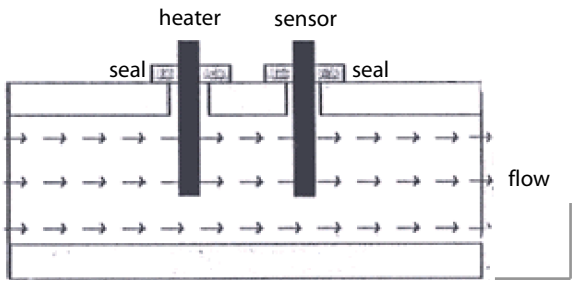
Measuring principle

The device consists of a metal base plate with a straight through boring. Two sensors are encased with stainless steel and extend into this bore, one of them designed as a heater and the other one as a temperature probe. A constant temperature difference (ΔT) is created between the two sensors. The energy required to maintain this (ΔT) is dependent on the mass flow.

Both values are proportional, i.e. the higher the flow the more energy is required to maintain the chosen temperature difference (ΔT), which normally is 10 °C.
The working principle is based on King's law of the ratio between mass flow and heating energy. The following equation demonstrates the correlation:

$$P = P0 + C\dot{m}^{n}$$

P	=	total heater power
P0	=	heater power at zero flow
C	=	constant
$\dot{m}$	=	mass flow
n	=	dimensionless number (typ. 0,5)



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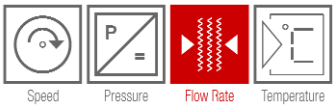

Measuring Range

Mass Flowmeter Model	Measuring Range (air) (intermediate values possible)	Process Connection	Nominal Lenght mm	Accuracy
ECOFLOW2-1	0,10 - 2,0 NL/min	G 1/4, PN 16	95	± 2 %
ECOFLOW2-2	0,50 - 10,0 NL/min	G 1/4, PN 16	95	± 2 %
ECOFLOW2-3	0,25 - 05,0 NL/min	G 1/4, PN 16	95	± 2 %
ECOFLOW2-4	1,00 - 20,0 NL/min	G 1/4, PN 16	95	± 2 %
ECOFLOW2-5	1,50 - 30,0 NL/min	G 1/4, PN 16	95	± 2 %
ECOFLOW2-6	2,50 - 50,0 NL/min	G 1/4, PN 16	95	± 2 %
ECOFLOW2-7	5,00 - 100,0 NL/min	G1/2	116	± 2 %
ECOFLOW2-8	10,00 - 200,0 NL/min	G1/2	116	± 2 %

Technical Dates

Output	4 - 20 mA, 3-Leiter
Power supply	24 V, DC, 115 mA

Flow Rate-Correction Calculator GDR 1403

The GDR 1403 loads the mass flowmeter ECOFLOW 2 with 24 V, DC and records the 4-20 mA-signal on one or two channels. On the LCD-display it indicates the current flow rate in Nm³/h, Nl/min, m³/h and l/min as well as the quantity in Nm³, Nl, m³ und l.

For the improvement of accuracy of the sensor (± 2%) it has a linearization module with 12 linearization control points which upgrade the accuracy to ± 1%. The specific characteristic lines for all nominal values can be deposited in the correction calculator.

The option SD (integrated recording function) guarantees a fast locating of failure during operation as it logs all measuring values in an 1 GB storage.

Following more options available:

- 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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