

Gas Quality Measuring Device GQS 400-F

Micro-electromechanical gas quality measuring device. Thermal conductivity, specific heat and relative density of various gases can be measured based on a micro-thermal CMOS sensor, in combination with a critical nozzle and a switching valve. The device determines amongst others the superior calorific value, methane number and Wobbe Index from these values.

such as natural gas vehicles (NGVs), industrial burners or combined heat and power plants.

Compared to process gas chromatographs, the standard solution for measuring gas compositions, this independently working unit requires neither recalibration nor reference gases, is robust, compact and inexpensive. It is suitable for applications



Technical Data

- Measuring range: $H_{s,n}^1 = 28.0 \dots 50.0 \text{ MJ/m}^3$
- Accuracy:

superior calorific value ¹ ($H_{s,n}$)	$\leq \pm 1 \text{ MJ/m}^3$
relative density ¹	$\leq \pm 0.005$
Wobbe index ¹ ($W_{s,n}$)	$\leq \pm 1 \text{ MJ/m}^3$
methane number ¹	$\leq \pm 3$
- Repeatability: $\pm 0.5 \text{ MJ/m}^3 / \pm 0.003 / \pm 0.5 \text{ MJ/m}^3 / \pm 2$
- Measuring cycle time: approx. 30 seconds
- Gas consumption: approx. 0.1 l/measurement
- Temperature range: $-10 \dots 55^\circ\text{C}^2$
- Pressure range: min. 2 bar(a), max. 6 bar(a)
- Weight: 2.0 kg
- Dimensions (L x B x H): 213 x 80 x 137 mm
- Gas connections: G1/8 inside thread
- Output signal: Modbus-RTU (EIA-485 2-wire)
- Supply voltage: 12 V/DC $-5\%/+10\%$
- Power requirement: $< 1.0 \text{ W}$
- IECEx/ATEX: Ex II 1G Ex ia IIC T4 Ga X³

¹ Reference conditions 25°C, 0°C, 1.01325 bar

² Extended temperature range on request

³ Certification pending

GQS - Gas Quality Sensing

GQS Technology

The GQS 400-F uses micro thermal anemometers for gas quality measurement. Process gas chromatographs, the industry standard solution for the determination of gas compositions, are unwieldy, slow, susceptible and too expensive for mass use in vehicles (NGVs), industrial burners or combined heat and power plants (CHP). Chip-based integrated micro-electromechanical sensors satisfy these requirements.

The micro-thermal sensors are measuring the thermal conductivity as well as the specific heat and, by means of an additional flow measurement by a critical nozzle, the density. These physical bulk parameters are used to

deduce gas quality values such as the air/gas ratio, the methane number, the Wobbe Index or the superior calorific value. This requires no knowledge about the composition of the gas.

A physical model has been developed for both, the critical nozzle as well as the micro thermal sensor. It is based on the same physical parameters, which are used for the correlation of the required gas quality value. The model allows to measure the prediction of the results even without a measurement of the given gas mixture; a big advantage towards already existing correlative measuring systems and ideally suitable to meet application-specific customer needs.

Technical data is subject to change without notice.

For More Information

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