

## smartMODUL<sup>FLOW</sup> // Technical Data

Infrared gas sensor for perfusion with digital interfaces



Infrared gas sensor using dual beam technology with measurement and reference channel for use in analytical devices and process control applications. Integrated evaluation electronics for drift and temperature compensation. Robust aluminium cuvette with gas line connectors.

- Infrared measuring principle (NDIR)
- Dual beam technology
- Modbus ASCII via UART
- Robust aluminium cuvette
- 3/5mm gas line connectors
- Temperature compensation
- High selectivity
- Customer-specific modules possible

Gases *	Measurement range	Model type
acetylene $C_2H_2$	0-2.3 Vol.-% (0-100 % LEL)	F1-010236-00000
ammonia $NH_3$	0-3.5 Vol.-%	F1-200356-00000
n-butane $C_4H_{10}$	0-1.4 Vol.-% (0-100 % LEL)	F1-020146-00000
	0-100 Vol.-%	F1-020108-00000
ethylene $C_2H_4$	0-2.4 Vol.-% (0-100 % LEL)	F1-030246-00000
	0-2000 ppm	F1-030205-00000
carbon dioxide $CO_2$	0-5000 ppm (0-100 % TLV)	F1-212505-00000
	0-5 Vol.-%	F1-212506-00000
	0-20 Vol.-%	F1-212207-00000
	0-100 Vol.-%	F1-212108-00000
carbon monoxide $CO$	0-2 Vol.-%	F1-221206-00000
	0-10 Vol.-%	F1-221107-00000
	0-100 Vol.-%	F1-221108-00000
methane $CH_4$	0-4.4 Vol.-% (0-100 % LEL)	F1-040446-00000
	0-100 Vol.-%	F1-040108-00000
propane $C_3H_8$	0-1.7 Vol.-% (0-100 % LEL)	F1-050176-00000
	0-100 Vol.-%	F1-050108-00000
sulphur hexafluoride $SF_6$	0-50 ppm	F1-600503-00000
	0-1000 ppm (0-100 % TLV)	F1-600105-00000
	(0) 90-100 Vol.-% **	F1-600108-00000
dichlorotrifluoroethane $R123$	0-2000 ppm	F1-730205-00000
pentafluoroethane $R125$	0-2000 ppm	F1-720205-00000
tetrafluoroethane $R134a$	0-2000 ppm	F1-710205-00000
refrigerant $R404a$	0-2000 ppm	F1-740205-00000
chlorodifluoromethane $R22$	0-2000 ppm	F1-700205-00000

\* More gases and measuring ranges on request

\*\* Device under test

Sensors similar to the illustration

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General features	
Measurement principle:	Non Dispersive Infra-Red (NDIR), dual wavelength
Measurement range:	dependent on model – see list
Gas supply:	by perfusion
Dimensions:	Length (model dependent) x 28 mm x 42 mm (L x W x H) <sup>3</sup>
Gas line connectors:	3 mm internal, 5mm outer diameter
Technical features @ 25°C, 1013 mbar gas pressure, 0.5 l/min constant gas flow	
Response time (t <sub>90</sub> ):	Appr. 15 s (at 0.5 l/min) <sup>3</sup>
Resolution:	1 ppm to 0.01 Vol.% FS <sup>1</sup>
Accuracy:	≤ ±2 % FS <sup>1</sup>
Long term stability (zero):	≤ ±2 % FS <sup>1</sup> over 12 month period
Long term stability (span):	≤ ±2 % FS <sup>1</sup> over 12 month period
Repeatability:	≤ ±2 % FS <sup>1</sup>
Linearity error:	≤ ±1 % FS <sup>1</sup>
Lower detection limit:	≤ 1 % FS <sup>1</sup> (typically)
Operating temperature:	-10 °C to 40 °C
Storage temperature:	-20 °C to 60 °C
Humidity:	0 % to 95 % rel. humidity (not condensing)
Temp. dependence (zero):	≤ ±0.01 % FS <sup>1</sup> per °C
Temp. dependence (span):	≤ ±0.2 % FS <sup>1</sup> per °C
Air pressure:	950 to 1050 mbar
Pressure dependence (zero):	-
Pressure dependence (span):	0.1 % to 0.2 % per mbar <sup>2</sup>
Warm-up time:	< 2 minutes (start up time) < 30 minutes (full specification)
Flow rate:	0.2 - 1.5 l/min
Communication	
Digital output signal:	Modbus ASCII via UART
Electrical data	
Supply voltage:	6 V DC ± 5 %
Supply current:	70 mA average, max. 140 mA
Power consumption:	< 1 Watt

<sup>1</sup> FS = Full scale | <sup>2</sup> Dependent on the gas and the measurement range | <sup>3</sup> Dependent on model type

Please consult smartGAS Marketing for parts specified with other temperature and measurement ranges.

At first initiation and depending on application and ambient conditions recalibration is recommended. Recurring cycles of recalibration are recommended.

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