

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

Infrared gas sensor for perfusion with analogue and digital interfaces



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

- Infrared measuring technology (NDIR)
- Dual beam technology
- Analogue interfaces (e.g. 4 - 20 mA)
- Modbus ASCII via RS485
- Input voltage 12 - 28 Volt DC
- Zero and span calibration by jumper
- 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)	P1-010236-00000
ammonia $NH_3$	0-3.5 Vol.-%	P1-200356-00000
n-butane $C_4H_{10}$	0-1.4 Vol.-% (0-100 % LEL)	P1-020146-00000
	0-100 Vol.-%	P1-020108-00000
ethylene $C_2H_4$	0-2.4 Vol.-% (0-100 % LEL)	P1-030246-00000
	0-2000 ppm	P1-030205-00000
carbon dioxide $CO_2$	0-5000 ppm (0-100 % TLV)	P1-212505-00000
	0-5 Vol.-%	P1-212506-00000
	0-20 Vol.-%	P1-212207-00000
	0-100 Vol.-%	P1-212108-00000
carbon monoxide $CO$	0-2 Vol.-%	P1-221206-00000
	0-10 Vol.-%	P1-221107-00000
	0-100 Vol.-%	P1-221108-00000
methane $CH_4$	0-4.4 Vol.-% (0-100 % LEL)	P1-040446-00000
	0-100 Vol.-%	P1-040108-00000
propane $C_3H_8$	0-1.7 Vol.-% (0-100 % LEL)	P1-050176-00000
	0-100 Vol.-%	P1-050108-00000
sulphur hexafluoride $SF_6$	0-50 ppm	P1-600503-00000
	0-1000 ppm (0-100 % TLV)	P1-600105-00000
	(0) 90-100 Vol.-% **	P1-600108-00000
dichlorotrifluoroethane $R123$	0-2000 ppm	P1-730205-00000
pentafluoroethane $R125$	0-2000 ppm	P1-720205-00000
tetrafluoroethane $R134a$	0-2000 ppm	P1-710205-00000
refrigerant $R404a$	0-2000 ppm	P1-740205-00000
chlorodifluoromethane $R22$	0-2000 ppm	P1-700205-00000

\* 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>
PCB Dimensions:	72 mm x 55 mm x 34 mm (L x W x H)
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
Calibration:	zero by jumper / SW and span by jumper
Communication	
Analogue output signal:	0 - 20 mA linear 4 - 20 mA linear 0 - 1 V linear (with 50 Ω) 0 - 2 V linear (with 100 Ω)
Maximum load:	125 Ω
Digital output signal:	Modbus ASCII via RS485
Electrical data	
Supply voltage:	12 - 28 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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