

smartMODUL^{PREMIUM} // Technical Data

Infrared gas sensor for flow operation 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
- Pre calibrated
- 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
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

* More gases and measuring ranges on request

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 ⁽¹⁾
Gas supply:	by flow
Gas line connectors:	3 mm internal, 5 mm outer diameter
Flow rate:	0.2 to 0.8 l/min (constant)
Dimensions:	Length (model dependent) x 28 mm x 42 mm (L x W x H) ⁽¹⁾
PCB Dimensions:	72 mm x 55 mm x 34 mm (L x W x H)x
Warm-up time:	< 2 minutes (start up time) < 30 minutes (full specification)
Measuring response ⁽²⁾	
Response time (t ₉₀):	Appr. 15 s (@ 0.5 l/min) ⁽¹⁾
Digital resolution (@ zero):	1 ppm / 0.1 % LEL / 0.01 Vol.-% / 0.1 Vol.-% ⁽¹⁾
Detection Limit (3 σ):	≤ 1 % FS ⁽³⁾ (typically)
Repeatability:	$\leq \pm 1$ % FS ⁽³⁾
Linearity error ⁽⁴⁾ :	$\leq \pm 2$ % FS ⁽³⁾
Long term stability (span) ⁽⁶⁾ :	$\leq \pm 2$ % FS ⁽³⁾ over 12 month period
Long term stability (zero) ⁽⁶⁾ :	$\leq \pm 2$ % FS ⁽³⁾ over 12 month period
Influencing variable ⁽⁵⁾	
Temp. dependence (zero):	$\leq \pm 0.1$ % FS ⁽³⁾ per °C
Temp. dependence (span):	$\leq \pm 0.2$ % FS ⁽³⁾ per °C
Pressure dependence (zero):	-
Pressure dependence (span):	0.1% to 0.2 % value per hPa ⁽¹⁾
Electrical inputs and outputs	
Supply voltage:	12 to 28 V DC ± 5 %
Supply current:	70 mA average, max. 140 mA
Power consumption:	< 1 Watt
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
Calibration:	zero and span by jumper or SW
Climatic conditions	
Operating temperature:	-10 °C to 40 °C
Storage temperature:	-20 °C to 60 °C
Air pressure:	800 to 1200 hPa
Humidity:	0 % to 95 % rel. humidity (not condensing)

¹⁾ Dependent on the gas and the measurement range

²⁾ Relating to sample gas pressure 1013 hPa absolute, 0.5 l/min gas flow and 25°C ambient temperature

³⁾ FS = Full scale

⁴⁾ Stated linearity error excludes calibration gas tolerance of ± 2 %

⁵⁾ Relating to calibration conditions (see calibration sheet)

⁶⁾ For dry and clean test gas at 25°C and 1013hPa absolute - depending on the operating and ambient conditions values may differ

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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