

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
C_2H_2 acetylene	0-2.3 Vol.-% (0-100 % LEL)	P1-010236-00000
C_4H_{10} n-butane	0-1.4 Vol.-% (0-100 % LEL)	P1-020146-00000
	0-100 Vol.-%	P1-020108-00000
CO_2 carbon dioxide	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
CO carbon monoxide	0-2 Vol.-%	P1-222206-00000
	0-10 Vol.-%	P1-222107-00000
	0-100 Vol.-%	P1-222108-00000
C_2H_4 ethylene	0-2.4 Vol.-% (0-100 % LEL)	P1-030246-00000
CH_4 methane	0-4.4 Vol.-% (0-100 % LEL)	P1-040446-00000
	0-100 Vol.-%	P1-040108-00000
C_3H_8 propane	0-1.7 Vol.-% (0-100 % LEL)	P1-050176-00000
	0-100 Vol.-%	P1-050108-00000

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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:	≤ ± 1 % FS ⁽³⁾
Linearity error ⁽⁴⁾ :	≤ ± 2 % FS ⁽³⁾
Long term stability (zero) ⁽⁵⁾ :	≤ ± 2 % FS ⁽³⁾ over 12 month period
Long term stability (span) ⁽⁵⁾ :	≤ ± 2 % FS ⁽³⁾ over 12 month period
Influencing variable ⁽⁶⁾	
Temp. dependence (zero):	≤ ± 0.1 % FS ⁽³⁾ per °C
Temp. dependence (span):	≤ ± 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 and gas temperature

³⁾ FS = Full scale

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

⁵⁾ For dry and clean test gas at 25°C and 1013hPa absolute - depending on the operating and ambient conditions values may differ

⁶⁾ Relating to calibration conditions (see final check)

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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