INNOVATIVE GAS SENSORS

smartMODUL for refrigerants // Technical Data

Infrared gas sensor for refrigerant applications

R123 | R125 | R134a | R404a | R22

Infrared gas sensor using dual beam technology, with measurement and reference channel, for monitoring room air in cold storage houses and leak detection in cooling systems. Integrated evaluation electronics for drift and temperature compensation.

- Infrared measuring principle (NDIR)
- Dual beam technology
- Modbus ASCII via UART
- Pre calibrated
- Gas entry by diffusion
- High selectivity

Gases		Measurement range		Model type
R22	chlorodifluoromethane	0-1000 ppm		B1-700105-03000
		0-2000 ppm		B1-700205-03000
R123	dichlorotrifluoroethane	0-1000 ppm		B1-730105-03000
		0-2000 ppm		B1-730205-03000
R125	pentafluoroethane	0-1000 ppm		B1-720105-03000
		0-2000 ppm		B1-720205-03000
R134a	tetrafluoroethane	0-1000 ppm		B1-710105-03000
		0-2000 ppm		B1-710205-03000
R290	propane	0-1.7 Vol.-%	(0-100 % LEL)	B1-050176-03000
R404a	refrigerant	0-1000 ppm		B1-740105-03000
		0-2000 ppm		B1-740205-03000
R407a	refrigerant	0-1000 ppm		B1-750105-03000
		0-2000 ppm		B1-750205-03000
R407c	refrigerant	0-1000 ppm		B1-800105-03000
		0-2000 ppm		B1-800205-03000
R410a	refrigerant	0-1000 ppm		B1-760105-03000
		0-2000 ppm		B1-760205-03000
R507	refrigerant	0-1000 ppm		B1-770105-03000
		0-2000 ppm		B1-770205-03000
R600	n-butane	0-1.4 Vol.-%	(0-100 % LEL)	B1-020146-03000
R744	carbon dioxide	0-5 Vol.-%		B1-212506-03000
R1234yf	refrigerant	0-1000 ppm		B1-780105-03000
		0-2000 ppm		B1-780205-03000

More gases and measuring ranges on request

Sensors similar to the illustration

smartMODUL for refrigerants // Technical Data

Infrared gas sensor for refrigerant applications

General features	R22, R123, R125, R134a, R404a, R407a, R407c, R507, R744, R1234yf	R290, R410a, R600
Measurement principle:	Non Dispersive Infra-Red (NDIR), dual wavelength	
Measurement range:	dependent on model – see list [1]	dependent on model – see list [1]
Gas supply:	by diffusion (atmospheric pressure)	by diffusion (atmospheric pressure)
Dimensions:	62 mm x 37 mm x 30 mm (L x W x H)	62 mm x 37 mm x 30 mm (L x W x H)
Warm-up time:	< 2 minutes (start up time) < 30 minutes (full specification)	< 2 minutes (start up time) < 30 minutes (full specification)
Measuring response [2]		
Response time (t_{90}):	Appr. 30 s	Appr. 30 s
Digital resolution (@ zero):	1 ppm / 0.1 % LEL / 0.01 Vol.-% [1]	1 ppm / 0.1 % LEL / 0.01 Vol.-% [1]
Detection Limit (3 σ):	≤ 1 % FS[3] (typically)	≤ 2 % FS[3] (typically)
Repeatability:	≤ ± 1 % FS[3]	≤ ± 2 % FS[3]
Linearity error [4]:	≤ ± 2 % FS[3]	≤ ± 4 % FS[3]
Long term stability (zero) [5]:	≤ ± 2 % FS[3] over 12 month period	≤ ± 4 % FS[3] over 12 month period
Long term stability (span) [5]:	≤ ± 2 % FS[3] over 12 month period	≤ ± 4 % FS[3] over 12 month period
Influencing variable [6]		
Temp. Dependence (zero):	≤ ± 0.2 % FS[3] per °C	≤ ± 0.2 % FS[3] per °C
Temp. Dependence (span):	≤ ± 0.4 % FS[3] per °C	≤ ± 0.4 % FS[3] per °C
Pressure Dependence (zero):	-	-
Pressure Dependence (span):	0.1 % to 0.2 % value per hPa [1]	0.1 % to 0.2 % value per hPa [1]
Electrical inputs and outputs		
Supply voltage:	6 V DC ± 5 %	6 V DC ± 5 %
Supply current:	70 mA average, max. 140 mA	70 mA average, max. 140 mA
Power consumption:	< 1 Watt	< 1 Watt
Digital output signal:	Modbus ASCII via UART	Modbus ASCII via UART
Calibration:	zero and span by SW	zero and span by SW
Climatic conditions		
Operating temperature:	-20 °C to 40 °C	-20 °C to 40 °C
Storage temperature:	-25 °C to 60 °C	-25 °C to 60 °C
Air pressure:	800 to 1200 hPa	800 to 1200 hPa
Humidity:	0 % to 95 % rel. humidity (not condensing)	0 % to 95 % rel. humidity (not condensing)

Also available with additional pcb as CONNECT (C1- ...) with a wider supply voltage range of 12 - 28V DC, analog signal output 0 (4) - 20 mA and digital output RS 485.

[1] Dependent on the gas and the measurement range
[2] Relating to atmospheric pressure 1013 hPa absolute and 25 °C ambient temperature (type Diffusion) or sample gas pressure 1013 hPa absolute, 0.5 l/min gas flow and 25°C ambient and gas temperature (type Flow)
[3] FS = Full scale
[4] Stated linearity error excludes calibration gas tolerance of ± 2 %, (± 5 % with blends)
[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.

05.1 | 08.2012

airmet
Work with Confidence

Air-Met Scientific Pty Ltd

Air-Met Sales/Service
P: 1800 000 744
F: 1800 000 774
E: sales@airmet.com.au

Air-Met Rental
P: 1300 137 067
E: hire@airmet.com.au
W: www.airmet.com.au