

# smartMODUL for refrigerants // Technical Data

Infrared gas sensor for refrigerant applications



- Infrared measuring principle (NDIR)
- Dual beam technology
- Modbus ASCII via UART
- Temperature compensation
- High selectivity

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.

## Gas supply by diffusion



Gases *	Measurement range	Model type
dichlorotrifluoroethane <a href="#">R123</a>	0-2000 ppm	B1-730205-04000
pentafluoroethane <a href="#">R125</a>	0-2000 ppm	B1-720205-04000
tetrafluoroethane <a href="#">R134a</a>	0-2000 ppm	B1-710205-04000
refrigerant <a href="#">R404a</a>	0-2000 ppm	B1-740205-04000
chlorodifluoromethane <a href="#">R22</a>	0-2000 ppm	B1-700205-04000

## Gas supply by perfusion



Gases *	Measurement range	Model type
dichlorotrifluoroethane <a href="#">R123</a>	0-2000 ppm	F1-730205-04000
pentafluoroethane <a href="#">R125</a>	0-2000 ppm	F1-720205-04000
tetrafluoroethane <a href="#">R134a</a>	0-2000 ppm	F1-710205-04000
refrigerant <a href="#">R404a</a>	0-2000 ppm	F1-740205-04000
chlorodifluoromethane <a href="#">R22</a>	0-2000 ppm	F1-700205-04000

\* 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	Diffusion B1- ...	Perfusion F1- ...
Measurement principle:	Non Dispersive Infra-Red (NDIR), dual wavelength	
Measurement range:	0 - 2000 ppm	0 - 2000 ppm
Gas supply:	by diffusion	by perfusion
Dimensions:	62 mm x 37 mm x 30 mm (L x W x H)	11 mm x 28 mm x 42 mm (L x W x H) <sup>3</sup>
Gas line connectors:	-	3 mm internal, 5mm outer diameter
<b>Technical features</b>	@ 25°C, 1013 mbar gas pressure,	0.5 l/min constant gas flow
Response time (t90):	Appr. 30 s	Appr. 15 s (at 0.5 l/min)
Resolution:	1 ppm	1 ppm
Accuracy:	≤ ±2 % FS <sup>1</sup>	≤ ±2 % FS <sup>1</sup>
Long term stability (zero):	≤ ±2 % FS <sup>1</sup> over 12 month period	≤ ±2 % FS <sup>1</sup> over 12 month period
Long term stability (span):	≤ ±2 % FS <sup>1</sup> over 12 month period	≤ ±2 % FS <sup>1</sup> over 12 month period
Repeatability:	≤ ±2 % FS <sup>1</sup>	≤ ±2 % FS <sup>1</sup>
Linearity error:	≤ ±1 % FS <sup>1</sup>	≤ ±1 % FS <sup>1</sup>
Lower detection limit:	< 10 ppm	< 10 ppm
Operating temperature:	-25 °C to 25 °C	-25 °C to 25 °C
Storage temperature:	-25 °C to 60 °C	-25 °C to 60 °C
Humidity:	0 % to 95 % rel. humidity (not condensing)	0 % to 95 % rel. humidity (not condensing)
Temp. dependence (zero):	≤ ±0.05 % FS <sup>1</sup> per °C	≤ ±0.05 % FS <sup>1</sup> per °C
Temp. dependence (span):	≤ ±0.2 % FS <sup>1</sup> per °C	≤ ±0.2 % FS <sup>1</sup> per °C without heating
Air pressure:	950 to 1050 mbar	950 to 1050 mbar
Pressure dependence (zero):	-	-
Pressure dependence (span):	0.1 % per mbar <sup>2</sup>	0.1 % per mbar <sup>2</sup>
Warm-up time:	< 2 minutes (start up time) < 30 minutes (full specification)	< 2 minutes (start up time) < 30 minutes (full specification)
Flow rate:	-	0.2 - 1.5 l/min
<b>Communication</b>	Modbus ASCII via UART	
<b>Electrical data</b>	6 V DC ± 5 %	
Supply voltage:	70 mA average, max. 140 mA	
Supply current:	< 1 Watt	
Power consumption:		

<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.

All rights reserved. Any logos and/or product names are trademarks of smartGAS. The reproduction, transfer, distribution or storage of information contained in this brochure in any form without the prior written consent of smartGAS is strictly prohibited. All specifications – technical included – are subject to change without notice. Depending on the application, the target gas and the measurement range the technical data may differ. No liability is accepted for any consequential losses, injury or damage resulting from the use of this document or from any omissions or errors herein. The data is given for guidance only. It does not constitute a specification or an offer for sale.

For more information, please visit [www.smartGAS.eu](http://www.smartGAS.eu) or contact us at [sales@smartgas.eu](mailto:sales@smartgas.eu)