Product Data Sheet

Product Datasheet

IRceL CH4 Methane Sensor

Document Purpose

The purpose of this document is to present the performance specification of the IRceL CH4 Methane gas sensor.

This document should be used in conjunction with the Operating Principles (OP17) and the Product Safety Datasheet (PSDS 21).

The data provided in this document are valid at 20°C, 50% RH and 1013 mBar for 3 months from the date of sensor manufacture.

Output signal can drift below the lower limit over time. For guidance on the safe use of the sensor, please refer to the Operating Principles OP17.

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Key Features & Benefits:

- Integrated thermistor for accurate temperature compensation
- EEPROM programmed with sensor specfic performance characteristics
- Compact Size

Technical Specifications

MEASUREMENT

Operating Principle	Non-Dispersive Infra-Red (NDIR)
Measurement Range	0-5% vol. Methane
Accuracy (-20°C to +50°C)	Within ± (0.1% vol CH_4 + 4% of concentration)
Response Time (T_{90})*	< 35 Seconds
Repeatability:	
Zero	< ±0.015% CH_4
5% CH_4	< ±0.05% CH_4
Linearity	See Operating Principles OP17

ELECTRICAL

Supply Voltage	3-5 VDC, 3.3 V to utilise EEPROM calibration
Power Consumption	<100 mW at 3.3 V
Recommended Lamp Frequency	2 Hz, 50% duty cycle
Minimum Resolution	0.03% CH_4 at zero
	0.10% CH_4 at range
Warm-up Time	< 10 Seconds

MECHANICAL

Housing Material	Stainless Steel (see back page)
Weight	23 g
Orientation	Any

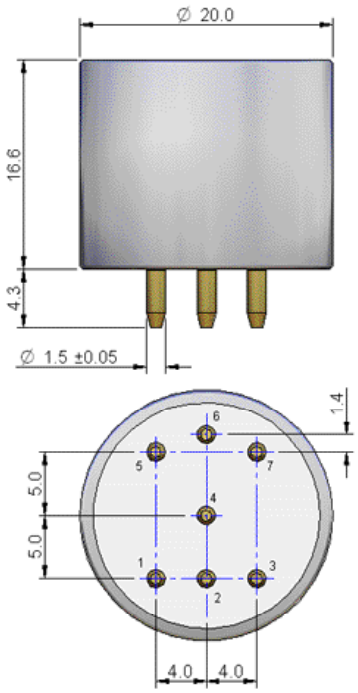
ENVIRONMENTAL

Operating Temperature Range	-20°C to +50°C
Operating Humidity Range	0 to 99% RH (non-condensing)
Operating Pressure Range	700 to 1300 mBar with compensation

LIFETIME

Long Term Zero Drift	< ±0.05% CH_4 per month
Recommended Storage Temp	-20°C to +50°C
MTBF	> 5 years

Product Dimensions



All dimensions in mm
All tolerances ±0.15mm unless otherwise stated

Pin	Function
1	Lamp Return
2	Lamp +5V
3	+5V Pyro Supply
4	Connector Output
5	Reference Output
6	Thermistat Output
7	0V Pyro Supply

IMPORTANT NOTE:
Connection should be made via PCB sockets only. Soldering to the pins will seriously damage your sensor.

*** Specifications are valid at 20°C, 50% RH and 1013 mBar, using City Technology recommended circuitry. Performance characteristics outline the performance of sensors supplied within the first 3 months. Output signal can drift below the lower limit over time.**

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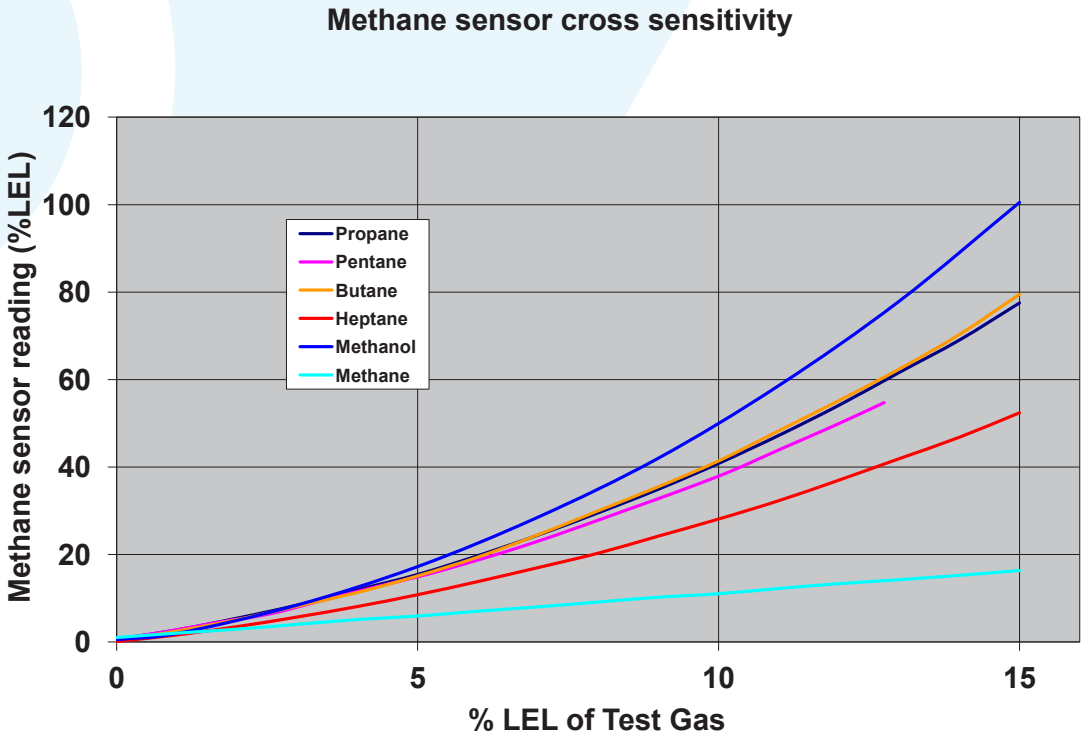
IRceL Cross Sensitivity

IMPORTANT NOTE : The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation. For the most accurate measurements, an instrument should be calibrated using the gas under investigation.



Typical Response of IRceL CH4 to common Alkanes and Methanol. Note that cross sensitivity is device to device variable and temperature dependant.

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Product Approval

Approval Body: UNDERWRITERS LABORATORIES INC®
Test Standard: UL913
CSA.C22.2 No 157
Product Categories: Class 1, Division 1, Groups A, B, C, D
File Number: E180262

Approval Body: SIRA CERTIFICATION SERVICE
Test Standard: EN 60079-0:2009 General Requirements
EN 60079-1:2007 Flameproof Enclosures "d"
EN 60079-31:2009 Explosive atmospheres. Equipment dust ignition protection by enclosure "t"

Product Categories: ExdI/IIC T4 (T_{amb} -20°C to +55°C),
Pmax = 1.4W MbGb
ExtIIICT135°CIP6xDb
II2GD/IM2 0518

Certificate Number: Sira 04ATEX1084X

Instructions specific to hazardous area installations (reference European ATEX Directive 94 / 9/ EC, Annex II, 1.0.6.)

The following instructions apply to equipment covered by certificate number Sira 04ATEX1084X;

1. The equipment may be used with flammable gases and vapours with apparatus groups IIA, IIB and IIC and with temperature classifications T1, T2, T3 and T4.
2. The equipment is certified for use in ambient temperatures of -20ºC to +55ºC.
3. The equipment has not been assessed as a safety related device (as referred to by Directive 94 / 9 / EC Annex II, clause 1.5).
4. Installation of the equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice (e.g. EN 60079-14)
5. Inspection and maintenance of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice (e.g. EN 60079-17).
6. Repair of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice (e.g. EN 60079-19).
7. Special conditions for safe use

7.1. The IRceL is designed to be connected to a gas detector which shall provide an intrinsically safe supply and having a maximum output power (P_{max}) not greater than 1.4 watt.

7.2. Because the IRceL has not been proven to withstand the impact and drop tests prescribed in EN 60079-0:2009, clauses 26.4.2 and 26.4.3, additional protection shall be provided to ensure that it cannot be subjected to such mechanical stresses.

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8. The certification of this equipment relies upon the following materials used in its construction;

Enclosure material: either 303 stainless steel, which contains less than 6% magnesium
or 304 stainless steel, which contains less than 6% magnesium

Flame arrester: 316 stainless steel mesh

Cement: CW2248/HY956EN

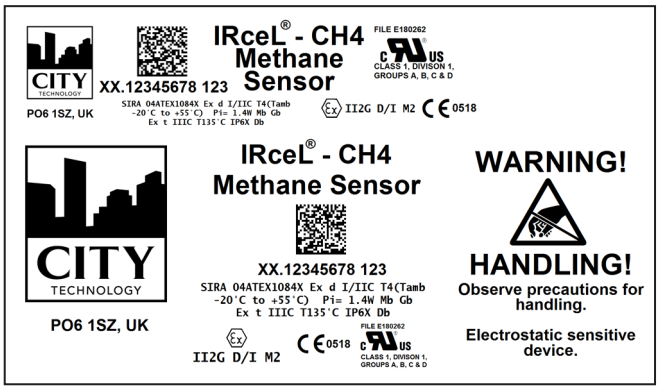
Manufacturer	Ciba-Geigy
Type of compound	Epoxy resin
Colour	Beige (natural)
Filler type and %	55.2% trihydrated Al_2O_3
Other additives	8.3%
Surface treatments	None
Temperature index	170°C
City Tech reference	RM 497

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive substances: e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

Suitable precautions: regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.

9. The IRceL is available in several formats depending upon the optical filter and components employed. The Certification marking is shown below using the IRceL CH4 label as an example:



SAFETY NOTE
This sensor is designed to be used in safety critical applications. To ensure that the sensor and/or instrument in which it is used, are operating properly, it is a requirement that the function of the device is confirmed by exposure to target gas (bump check) before each use of the sensor and/or instrument. Failure to carry out such tests may jeopardize the safety of people and property.