

1LEL 75 Sensor

Combustible Gas Sensor

Part Number: PM979-600-CIT

Document Purpose

The purpose of this document is to present the performance specification of the 1LEL 75 Combustible Gas Sensor.

This document should be used in conjunction with the 1LEL 75 Characterisation Note, the Operating Principles (OP01), Instructions for Safe Use, and the Product Safety Datasheet (PSDS 22).

The data provided in this document are valid at 20°C, 50% rH and 1013 mbar for three months from the date of sensor manufacture. For guidance on sensor performance outside of these limits, please refer to the 1LEL 75 Characterisation Note.

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 OP01 and the Instructions for Safe Use.



KEY FEATURES & BENEFITS



Low profile design
with a small
form factor



Designed to
meet industry
performance
standards



Enhanced
performance
over an extended
environmental
range



Approved to IP67



Approved for use in
Zone 0 applications



RoHS compliant

TECHNICAL SPECIFICATIONS

Measurement

Operating Principle	Catalytic Oxidation
Gases Detected	Most combustible gases and vapours
Nominal Range	0% LEL to 100% LEL
Inboard Filter	To remove H ₂ S
Inboard Filter Capacity	1000 ppm hr min.
Sensitivity*	31 mV/%CH ₄ ±5 mV/%CH ₄
T90 Response Time*	<20 seconds (methane) at 20°C
Poison Resistance	Resistant to H ₂ S poisoning; superior silicone resistance
Resolution	1% LEL
Output Linearity	Linear up to 3% vol. CH ₄ (refer to Characterisation Note)

Electrical

Operating Voltage	3.3 Vdc ±0.05 Vdc
Operating Current	84 mA max.
Power Requirement	280 mW max.

Mechanical

Weight	< 5 g
Outer Body Material	PPS Fortron 1140L4
Position Sensitivity	None

Environmental

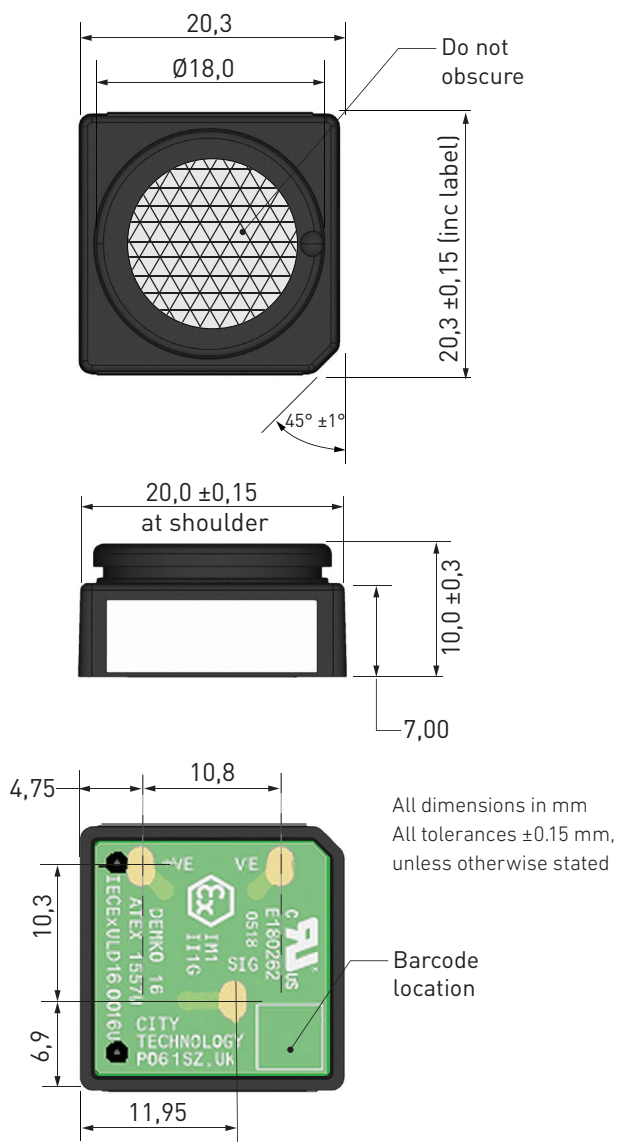
Ideal Storage Temperature	0°C to 20°C
Operating Temperature Range	-40°C to 60°C (refer to Characterisation Note for performance at <-20°C)
Operating Pressure Range	600 mbar to 1200 mbar
Operating Humidity Range	0% rH to 95% rH non-condensing

Lifetime

Storage Life	6 months in sealed container
Long Term Output Drift	<3% signal/month
Long Term Baseline Drift	<5% LEL _{methane} /month
Expected Operating Life	5 years in air

*Specifications are valid at 20°C, 50% rH, and 1013 mbar and flow rate of 300 ml/minute, using City Technology recommended circuitry. Performance characteristics outline the performance of sensors supplied within the first three months. Output signal can drift below the lower limit over time.

Product Dimensions





*Note: Fits recommended connector

List of Applicable Standards

- CENELEC EN 50303:2000 - Group I, Category M1 equipment intended to remain functional in atmospheres endangered by firedamp and/or coal dust
- CENELEC EN 60079-0:2012+A11:2013 - Explosive atmospheres – Part 0: Equipment. General requirements
- CENELEC EN 60079-1:2014 - Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures “d”
- CENELEC EN 60079-11:2012 - Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”
- IEC 60079-0 Ed. 6 + Corr. 1 + Corr. 2 + I-SH 01 + I-SH 02 - Explosive atmospheres – Part 0: Equipment. General requirements
- IEC 60079-1 Ed. 7 - Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures “d”
- IEC 60079-11 Ed. 6 + Corr. 1 + I-SH 01 + I-SH 02 + I-SH 03 - Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”
- UL 60079-0 Ed. 6 - Explosive atmospheres – Part 0: Equipment. General requirements
- UL 60079-1 Ed. 7 - Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures “d”
- UL 60079-11 Ed. 6 - Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”
- CSA C22.2 NO. 60079-0:15 - Explosive atmospheres – Part 0: Equipment. General requirements
- CSA C22.2 NO. 60079-1:16 - Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures “d”
- CSA C22.2 NO. 60079-11:14 - Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”

Approval Body: Underwriter’s Laboratories Inc.

Approval Body	Description	Underwriters Laboratory Inc.
	File Number	E 180262
	Certificate Number	DEMKO 16 ATEX 1557U IECEX ULD 16.0016U
	ATEX Marking	0518  IM1 II1G

Protection Concept Markings

Agency	Approvals
ATEX Marking	Ex da ia I Ma Ex da ia IIC Ga
UL Marking	Class 1 Zone 1 AEx da ia IIC Ga
Canadian Marking	Ex da ia I Ma Ex da ia IIC Ga

Entity Parameters

Entity	Measure	Entity	Measure
Ui	12 Volts	Ui	5 Volts
Ii	3.3 Amps	Ii	3.3 Amps
Pi	1.3 Watts	Pi	1.3 Watts
Ci	0	Ci	0
Li	-0	Li	-0

Schedule of Limitations (Denoted by U after the certificate number)

- The sensors have been evaluated for a service temperature range of -40°C to +60°C.
- With regard to thermal ignition, the sensors have been evaluated as suitable for Group I use or for Group II use with temperature code T4 for the stated service temperature range for $U_i = 5 \text{ V}$.
- For Group I applications with $U_i > 5 \text{ V}$, the sensors must be installed in an enclosure preventing ingress of coal dust.
- The device has not been assessed for resistance to impact or drop. The device shall be installed in a suitably certified enclosure, per type of protection and in accordance with IEC 60079-0.
- The device has an external non-metallic surface greater than 400 mm². It is therefore at risk of buildup of electrostatic charge. The device shall be installed within an enclosure and limited to 400 mm² of material exposure.
- With regard to breather thermal temperature, including safety factor of 1.2 - breather surface 99.244°C.



Life-saving solutions

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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.

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