1LEL 75M Sensor

Combustible Gas Sensor
Part Number: PM999-600-CIT

Document Purpose

The purpose of this document is to present the performance specification of the 1LEL 75M 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.

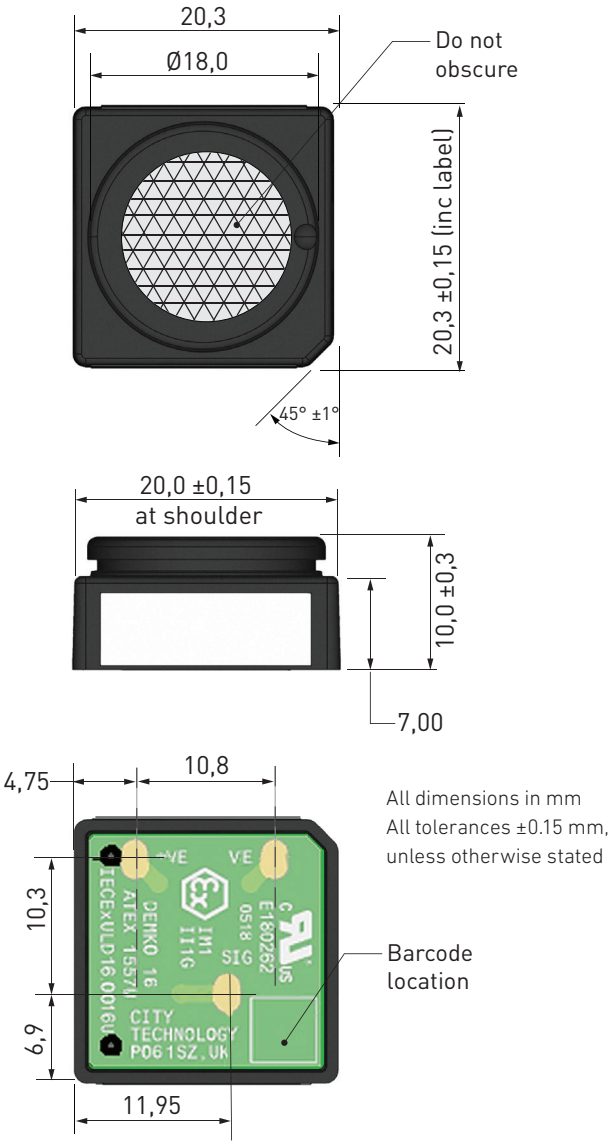
KEY FEATURES & BENEFITS

- 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	Methane and Hydrogen
Nominal Range	0% LEL to 100% LEL
Inboard Filter	To remove H_2S
Inboard Filter Capacity	1000 ppm hr min.
Additional Filter	Carbon cloth filter to improve silicone resistance
Sensitivity*	31 mV/%CH_4 ±5 mV/%CH_4 (TBA)
T90 Response Time*	<20 seconds (methane) at 20°C
Poison Resistance	Resistant to H_2S poisoning; superior silicone resistance
Resolution	1% LEL
Output Linearity	Linear 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 manufacturer 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



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

*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.
c UL us	**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 Ui = 5 V.
- For Group I applications with Ui > 5 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 the 400 mm . It is therefore at risk of buildup of electrostatic charge. The device shall be installed within an enclosure and limited to 400 mm^2 of material exposure.
- With regard to breather thermal temperature, including safety factor of 1.2 - breather surface 99.244°C.

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.

Every effort has been made to ensure the accuracy of this document at the time of printing. In accordance with the company's policy of continued product improvement the manufacturer reserves the right to make product changes without notice. The products are always subject to a programme of improvement and testing which may result in some changes in the characteristics quoted. As the products may be used by the client in circumstances beyond the knowledge and control of the manufacturer we cannot give any warranty as to the relevance of these particulars to an application. It is the clients' responsibility to carry out the necessary tests to determine the usefulness of the products and to ensure their safety of operation in a particular application.