

# 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** 

RoHS compliant

## TECHNICAL SPECIFICATIONS

### Measurement

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

### Electrical

<b>Operating Voltage</b>	3.3 Vdc ±0.05 Vdc
<b>Operating Current</b>	84 mA max.
<b>Power Requirement</b>	280 mW max.

### Mechanical

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

### Environmental

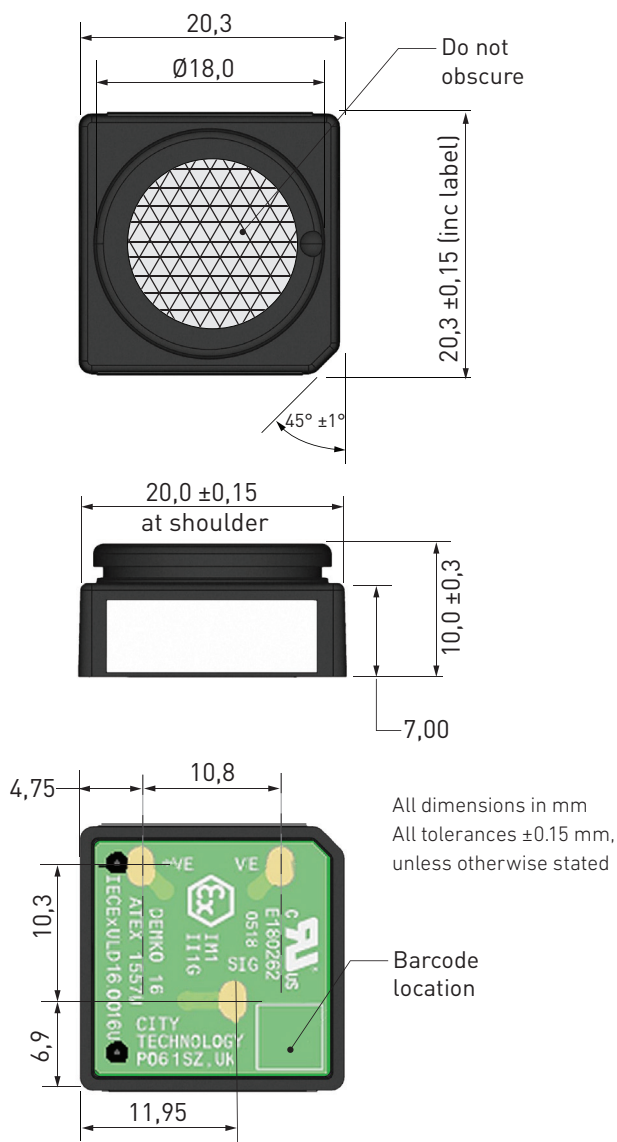
<b>Ideal Storage Temperature</b>	0°C to 20°C
<b>Operating Temperature Range</b>	-40°C to 60°C (refer to Characterisation Note for performance at <-20°C)
<b>Operating Pressure Range</b>	600 mbar to 1200 mbar
<b>Operating Humidity Range</b>	0% rH to 95% rH non-condensing

### Lifetime

<b>Storage Life</b>	6 months in sealed container
<b>Long Term Output Drift</b>	<3% signal/month
<b>Long Term Baseline Drift</b>	<5% LEL <sub>methane</sub> /month
<b>Expected Operating Life</b>	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.
	<b>File Number</b>	E 180262
	<b>Certificate Number</b>	DEMKO 16 ATEX 1557U IECEX ULD 16.0016U
	<b>ATEX Marking</b>	0518  IM1 II1G

### Protection Concept Markings

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

### Entity Parameters

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

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

- The sensors have been evaluated for a service temperature range of  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ .
- 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  $400\text{ mm}^2$ . It is therefore at risk of buildup of electrostatic charge. The device shall be installed within an enclosure and limited to  $400\text{ mm}^2$  of material exposure.
- With regard to breather thermal temperature, including safety factor of 1.2 - breather surface  $99.244^{\circ}\text{C}$ .

### 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.

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