

# 1LEL 75C Sensor

Combustible Gas Sensor

Part Number: PM989-600-CIT

## Document Purpose

The purpose of this document is to present the performance specification of the 1LEL 75C 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 mb ar 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

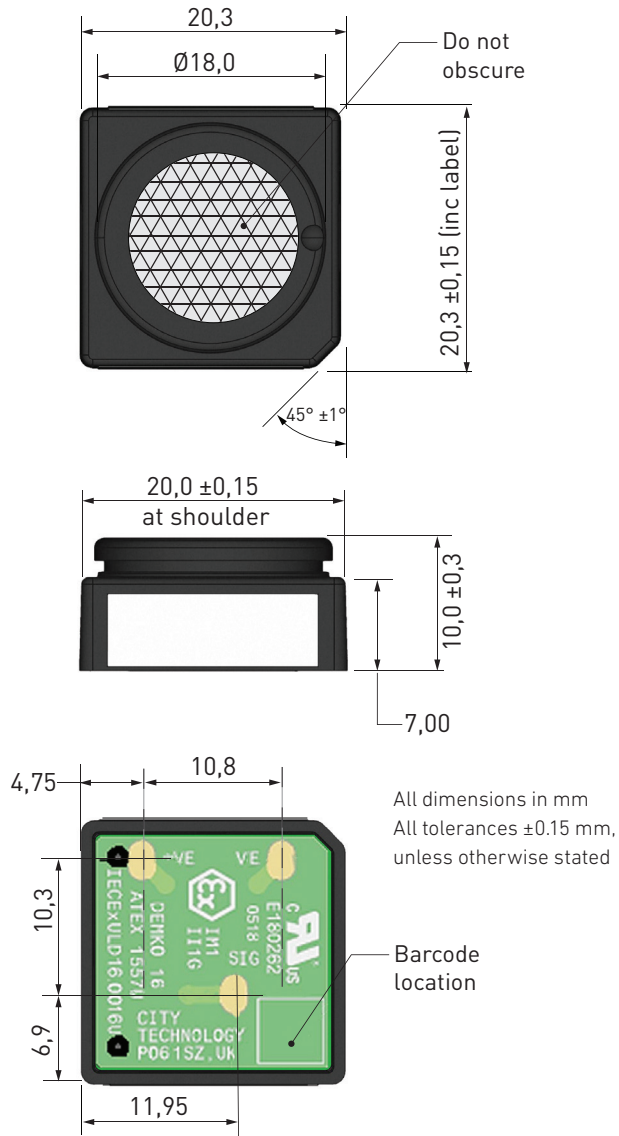
RoHS 

RoHS compliant

TECHNICAL SPECIFICATIONS	
Measurement	
<b>Operating Principle</b>	Catalytic Oxidation
<b>Gases Detected</b>	Most combustible gases and vapours up to C6
<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>Additional Filter</b>	Silica filter to improve silicone resistance
<b>Sensitivity*</b>	31 mV/%CH <sub>4</sub> ±5 mV/%CH <sub>4</sub> (TBA)
<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 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.

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 City Technology 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 City Technology, we cannot give any warranty as to the relevance of these particulars to an application. City Technology warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. City Technology's standard product warranty applies unless agreed to otherwise by City Technology in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to City Technology during the period of coverage, City Technology will repair or replace, at its option, without charge those items that City Technology, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall City Technology be liable for consequential, special, or indirect damages.** Though City Technology provides application assistance personally, or through our literature and website, it is buyer's sole responsibility to determine the suitability of the product in the application. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, City Technology assumes no responsibility for its use.