MICROPEL™ 75C GAS SENSOR

002872
Issue 1

MICROpeL 75C Combustible Gas Sensor

DOCUMENT PURPOSE

The purpose of this document is to present the performance specification of the MICROpeL 75C CiTipeL.

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

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. Output signal can drift below the lower limit over time.For guidance on sensor performance outside of these limits, please refer to the Operating Principles.

For guidance on the safe use of the sensor, please refer to the Operating Principles and the MICROpeL Pellistors Instructions for Safe Use.

PORTFOLIO
MICROceL® and MICROpeL® are one of the smallest, most compact sensors offered by Honeywell. The range includes carbon monoxide, hydrogen sulphide and fully certified combustible gas sensors.

1 YEAR WARRANTY
(12 months from date of shipment)

MICROpeL 75C Combustible Gas Sensor
Part Number: **PM769-000**

FEATURES AND BENEFITS

- ATEX, UL and CSA Approvals
- Withstands EN/IEC 60079-0 Impact Test
- Enhanced H_2S and Silicone Poison Resistance
- Reduced Orientation Effects

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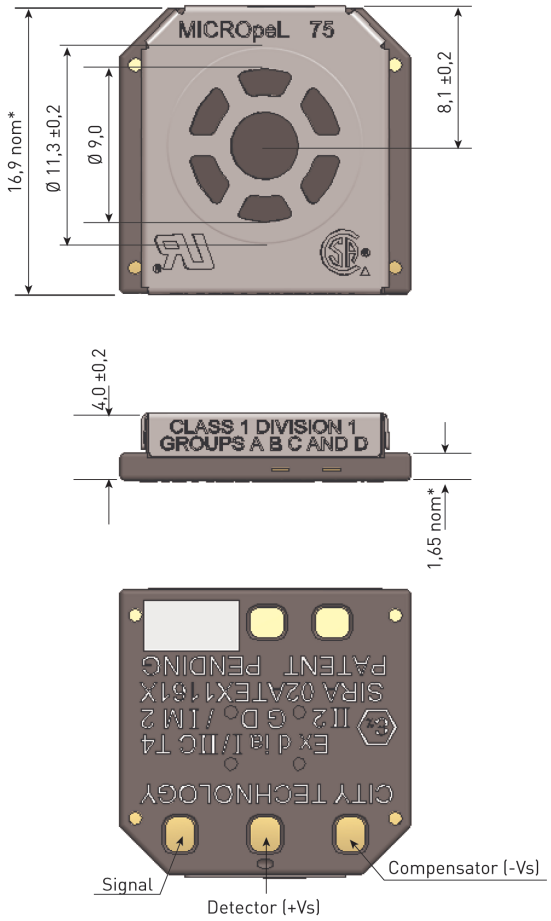
MICROPEL™ 75C
COMBUSTIBLE GAS SENSOR

TABLE 1. TECHNICAL SPECIFICATIONS	
MEASUREMENT	
Operating Principle	Catalytic Oxidation
Gases Detected (suitable for)	Methane, ethane, propane, butane, pentane, hexane, carbon monoxide & hydrogen
Gases Unsuitable For	Higher hydrocarbons, alcohols, ketones, esters, hydrogen sulfide and other sulfur containing compounds
Range	0 % LEL to 100 % LEL
Sensitivity*	31 ±5 mV/%methane
T90 Response Time*	<5 seconds (methane)
Poison Resistance	Resistance to H_2S poisoning Superior silicone resistance
Filter Lifetime	Typically >5 years
Linearity	Linear up to 3 % methane
ELECTRICAL	
Operating Voltage	3.30 Vdc ±0.02 Vdc
Detector Operating Current	78 mA ±6 mA
Maximum Power Consumption	295 mW
Resolution	1 % LEL
MECHANICAL	
Weight	2 g (nominal)
Orientation Sensitivity	None
ENVIRONMENTAL	
Operating Temperature Range	-20°C to 55°C
Operating Pressure Range	1 atm ±20 %
Operating Humidity Range	0 % to 90 %RH non-condensing
LIFETIME	
Long-Term Span Drift*	<5 % signal/month
Long-Term Zero Drift*	<5 % $LEL_{methane}$/month
Recommended Storage Temperature	0°C to 20°C
Shelf Life	6 months in sealed container
Warranty	12 months from date of dispatch

* Specifications are valid at 20°C, 50 %RH and 1013 mBar at a flow rate of 300 ml/min. Performance characteristics outline the performance of sensors supplied within the first 3 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 (B700). Details are available upon request.

RELATIVE SENSITIVITY

Important Notice

The relative response data shown below does not form part of the product specification and is supplied for guidance only. For the most accurate measurements, an instrument should be calibrated using the gas under investigation.

The table below shows the variation in response of the MICROpeL on exposure to a range of gases and vapours at the same %LEL concentration. The figures are experimentally derived and expressed relative to the methane signal (=100). Testing was performed using 2.5 % vol. CH_4 (50 %LEL CH_4 based on LEL values from the now obsolete EN 50054).

Relative response data are shown in the table below, based on the LEL values stated in EN 50054 (now obsolete) and EN 60079-20-1:2010.

TABLE 2. RELATIVE RESPONSE DATA

Gas/Vapour	Relative Sensitivity**	
	EN 50054 (obsolete)	EN 60079-20-1:2010
Methane	100	100
Propane	61	56
n-Butane	68	58
n-Pentane	63	72
Hydrogen	127	144
Ethylene	101	96
Acetylene	96	99
n-Heptane	49	61

** Each sensitivity has been rounded to the nearest 1 %.

MICROPEL™ 75C
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PRODUCT APPROVALS

TABLE 3. PRODUCT APPROVALS

Approval Body	SIRA Certification Service
sira CERTIFICATION	EN 60079-0:2012 Explosive Atmospheres Part 0 - General Requirements EN 60079-1:2014 Explosive Atmospheres - Equipment Protection by Flameproof Enclosures "d" EN 60079-11:2012 Explosive Atmospheres - Equipment Protection by Intrinsic Safety "i" EN 60079-31:2014 Explosive Atmospheres - Equipment Dust Ignition Protection by Enclosure "t"
Certification Code	Refer to Section 7.2
Certification Number	SIRA 02ATEX1161X
ATEX Marking	Ex II2 GD/IM2, CE 0518

Instructions specific to hazardous area installations
(reference European ATEX Directive 2014/34/EU, Annex II, 1.0.6.)

The following instructions apply to equipment covered by certificate numbers Sira 02ATEXII6X:

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 -20°C to 55°C.
3. The equipment has not been assessed as a safety related device (as referred to by Directive 2014/34/EU 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. The 'X' suffix to the certificate number relates to the following conditions for safe use;

   7.1. The product does not meet the drop tests described in EN 60079-0:2012 clauses 26.4.2 and 26.4.3. It shall therefore be protected from mechanical stresses caused by impact.

   7.2. The MICROpeL models have the following power and temperature ranges

MICROpeL models	Ex db ia I Mb (Ta -20°C to +55°C) @ Pmax 0.8W Ex da ia IIC T4 Ga (Ta -20°C to +55°C) @ Pmax 0.8W Ex t IIIC T135°C IP6X Db (Ta -20°C to +55°C) @ Pmax 0.8W
or	Ex db ia I Mb (Ta -20°C to +40°C) @ Pmax 0.49W Ex da ia IIC T5 Ga (Ta -20°C to +40°C) @ Pmax 0.49W Ex t IIIC T100°C IP6X Db (Ta -20°C to +40°C) @ Pmax 0.49W
or	Ex db ia I Mb (Ta -20°C to +55°C) @ Pmax 0.42W Ex da ia IIC T5 Ga (Ta -20°C to +55°C) @ Pmax 0.42W Ex t IIIC T100°C IP6X Db (Ta -20°C to +55°C) @ Pmax 0.42W

   7.3. The MICROpeL minature combustile gas sensors shall only be connected to a gas detector that provides a maximum, output power (P_0) not greater than that detailed in the list above. In the case of the MICROpeL 75 models, this shall be an intrinsically safe supply.

   7.4. This product is not resistant to light as required by clause 7.3 of EN 60079-0:2012. Therefore, it shall only be installed in a location where it is not exposed to direct sunlight or any other source of ultraviolet (UV) light.

   7.5. This sensor is not a standalone device. It is the responsibility of the detector / instrument manufacturer or designer that uses the sensor to ensure that the sensors are connected to ground with a maximum impedance of 10^9 Ω.

8. It is recommended that confirmation of adequate sensor performance be conducted on a regular basis by means of a defined, sensor calibration procedure. The calibration frequency will depend upon the environment in which the sensor is operated and on the perceived level of risk from the build up of flammable atmospheres.

9. The certification of this equipment relies upon the following materials used in its construction:

   Enclosure material: PEI, PPS, or PTFE

   Flame arrester: Stainless steel 316 mesh

   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.

10. The MICROpeL is available in several formats. Each will carry the certification shown in 10.1 on the sensor and as shown in 10.2 on the packaging:

    10.1. CITY TECHNOLOGY
    MODEL DESIGNATION
    SERIAL NUMBER (to include year of manufacture)
    Sira 02ATEX1161X

    CE 0518 Ex I M2
    II 1G
    II 2D

    The sensor may also contain information relevant to other certification bodies

    10.2. CITY TECHNOLOGY AND/OR CITY TECHNOLOGY LOGO.
    CITY TECHNOLOGY ADDRESS, PO6 1SZ, UK

    MODEL DESIGNATION
    Ex db ia I Mb; Ex da ia IIC T4 Ga; Ex t IIIC T135°C IP6X Db
    (Ta -20°C to +55°C) @ Pmax 0.8W

    The packaging may also contain information relevant to other certification bodies, as well as information e.g. patent numbers, of a non-certification nature.

11. Certain substances are known to have a detrimental effect on catalytic elements as used in the MICROpeL series.

    Poisoning: Some compounds will decompose on the catalyst and form a solid barrier over the catalyst surface. This action is cumulative and prolonged exposure will result in an irreversible decrease in sensitivity. The most common of these substances are: lead or sulphur containing compounds; silicones; phosphates.

    Inhibition: Certain other compounds, especially hydrogen sulphide and halogenated hydrocarbons, are absorbed or form compounds that are absorbed by the catalyst. The resultant loss of sensitivity is temporary and in most cases a sensor will recover after a period of operation in clean air.

In applications where it is suspected that poisons or inhibitors may be present, suitable protection for the MICROpeL should be provided.

Approval Body	Description	Underwriters Laboratory Inc.
	Test Standard	UL 913
	Product Categories	Class I, Division 1, Groups A, B, C and D
	Certificate Number	E 180262

CONDITIONS OF ACCEPTABILITY

1. These devices shall be installed in a suitable enclosure in accordance with the end product standard.
2. These devices shall be used within their specified electrical ratings.
3. These devices are intended for use in intrinsically safe circuits or within intrinsically safe devices.
4. Temperature test is to be performed on end use product.

Approval Body	Description	Canadian Standards Association	
	Applicable Requirements	CAN/CSA C22.2 No. 60079-0:19	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
		CAN/CSA C22.2 No. 60079-11:14 (R2023)	Electrical apparatus for explosive gas atmospheres - Part 11: Intrinsic safety
		CAN/CSA E60079-1:02	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosures
	Product Categories	Class I, Division 1, Groups A, B, C, D, and T3C	
	File Number	CSA 03CA1412957U	

Notes

1. The 75, 75C, or 75M sensors shall be connected to a gas detector which provides an intrinsically safe supply with a maximum output power (P_0) not greater than that 0.8 W (T4 where Tamb -40°C to +55°C) or 0.49 W (T5 where Tamb -40°C to +40°C) or 0.42 W (T5 where Tamb -40°C to +55°C). The sensor is suitable for use in a Class I, Zone 1, Group IIC atmospheres and Class I, Division 1, Group A, B, C, D when installed in an intrinsically safe gas detector.
2. These sensors are certified as components where the combustible gas performance tests shall be conducted on the gas detector with the final assembly subject to acceptance by CSA. The final assembly of the gas detector shall determine the markings or suitability for use in hazardous locations.
3. The sensor shall be protected from mechanical stresses caused by impact and drop tests, to be conducted on the final assembly.

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.

⚠ WARNING
IMPROPER INSTALLATION

- Consult with local safety agencies and their requirements when designing a machine-control link, interface and all control elements that affect safety.
- Strictly adhere to all installation instructions.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING
MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. The Honeywell standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, 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 Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide information or engineering support for its products through Honeywell personnel, literature and website, it is the buyer's sole responsibility to determine the suitability of the Honeywell product(s) for the buyer's requirements

Specifications may change without notice. The information we supply is believed to be accurate as of this writing. However, Honeywell assumes no responsibility for its use.

For more information

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