



**CITY**  
**TECHNOLOGY**  
ENGINEERING SAFETY

**1series**  
**ANALOGUE GAS SENSORS**



## Introducing 1series Analogue Gas Sensors

City Technology resets the size standard for gas sensing technology as the 1series demonstrates a significant reduction in size from previous sensing technology.

The 1series gas sensor is a small sensor that enables slim-profile gas detector design. Traditionally, sensors are fitted within instruments, such as portable life safety devices. With the 1series low-profile design, the sensors have turrets to mount into the front of the instrument in order to minimize instrument height. This revolutionary design also simplifies target-gas access to the sensor face and features an option for a replaceable external membrane.

With an extended operating life of five years and extended temperature and humidity range, 1series sensors are also designed to meet over multiple performance standards, including ANSI/ISA 92.00.01-2010, BS EN 45544-1:2015, and AS/NZS 4641-2007.

- **Low profile:** 1series unique compact square sensor design meets the requirement for thinner more lightweight gas detectors and eases instrument design & manufacturing. They are a third of the height of existing sensors
- **Enhanced specifications:** engineered with an operating life of five years, the 1series excels in challenging and extended temperature and humidity extremes
- **Surface mount spring contacts:** no PCB through holes to maximize sensor mounting flexibility
- **Sensor platform for the future:** 1series takes trusted City sensor technology and uses the same form factor of future platforms
- **Broad range of gases:** CO, H<sub>2</sub>S, O<sub>2</sub>, SO<sub>2</sub>, NO, NO<sub>2</sub>, O<sub>3</sub>, Cl<sub>2</sub>, LEL combustible gases
- **Easily identifiable:** 1series sensors can be easily identified with the unique housing color for each gas type



Wave 1 Sensors	1CO	1H <sub>2</sub> S	1O <sub>2</sub>	1SO <sub>2</sub>	LEL
<b>Target Gas</b>	Carbon Monoxide	Hydrogen Sulfide	Oxygen	Sulfur Dioxide	Combustible Gases***
<b>Technology</b>	Electrochemical	Electrochemical	Lead-free Electrochemical	Electrochemical	Catalytic Oxidation
<b>Measurement Range</b>	0.5 ppm CO to 1000 ppm CO (EN 45544 applications)	0.5 to 200 ppm H <sub>2</sub> S	0.6 to 25% vol. O <sub>2</sub>	0.1 to 20 ppm SO <sub>2</sub>	1% to 100% LEL
<b>Maximum Overload</b>	2000 ppm CO	500 ppm	30% vol. O <sub>2</sub>	150 ppm SO <sub>2</sub>	–
<b>Sensitivity*</b>	50 ±10 nA/ppm	175 ±35 nA/ppm	80 µA to 130 µA in air	160 ±40 nA/ppm	31 mV/%CH <sub>4</sub> ±5 mV/%CH <sub>4</sub>
<b>T50 Response Time*</b>	< 15 seconds (@ 20°C)	<15 seconds (@ 20°C)	< 10 seconds (@ 20°C)	< 10 seconds (@ 20°C)	–
<b>T90 Response Time*</b>	Typically < 20 seconds	Typically < 30 seconds	Typically < 15 seconds	Typically < 30 seconds	< 20 seconds (methane) at 20°C
<b>Recommended Load Resistor</b>	5 Ω to 10 Ω	5 Ω to 10 Ω	10 Ω	10 Ω	–
<b>Bias Voltage</b>	No bias	No bias	-600 mV ±10 mV	No bias	Consult LEL electrical specs
<b>Expected Operating Life</b>	5 years in air	5 years in air	5 years in air	5 years in air**	5 years in air
<b>Weight</b>	< 5 g	< 5 g	< 5 g	< 5 g	< 5 g
<b>Contact Material</b>	Gold plated	Gold plated	Gold plated	Gold plated	Gold plated
<b>Orientation Sensitivity</b>	None	None	<0.5% signal	None	None
<b>Operating Temperature Range</b>	-40°C to +60°C	-40°C to +60°C	-40°C to +60°C	Continuous: -20°C to +50°C Intermittent: -40°C to +55°C	-40°C to +60°C
<b>Operating Pressure Range</b>	600 mbar to 1200 mbar	600 mbar to 1200 mbar	600 mbar to 1200 mbar	600 mbar to 1200 mbar	600 mbar to 1200 mbar
<b>Long Term Output Drift*</b>	< 5% signal loss per annum	< 10% signal loss per annum	< 5% signal loss over operating life	< 10% signal loss per annum	< 3% signal/month
<b>Filter Information</b>	Activated carbon cloth filter with high surface area: <ul style="list-style-type: none"> <li>Removes acid gases such as SO<sub>2</sub>, NO<sub>2</sub>, and H<sub>2</sub>S</li> <li>25,000 ppm hours H<sub>2</sub>S filter capacity</li> <li>Protects from exposure to alcohol such as methanol, ethanol, and IPA (1000 ppm hours)</li> </ul>	No filter	No filter	Removes H <sub>2</sub> S; 400 ppm hours @ 25 ppm H <sub>2</sub> S	Removes H <sub>2</sub> S; consult LEL table below for information regarding additional filters
<b>Standards</b>	Designed to meet global performance standards: ANSI/ISA 92.00.01-2010 BS EN 45544-1:2015 AS/NZS 4641-2007	Designed to meet global performance standards: ANSI/ISA 92.00.01-2010 BS EN 45544-1:2015 AS/NZS 4641-2007	Designed to meet global performance standards: ANSI/ISA 92.04.01:2007 BS EN 50104:2010 AS/NZS 4641-2007	Designed to meet global performance standards: ANSI/ISA 92.00.01-2010 BS EN 45544-1:2015	UL 60079, IEC 60079, CENELEC EN 60079, CSA C22.2 No. 60079, (Parts 0, 1, and 11); CENELEC EN 50303:2000; DEMKO 16 ATEX 1557U IEC Ex ULD 16.0016U
<b>Catalog Listings</b>	AB010-R01A-CIT	AC400-R00A-CIT	AAW85-07WA-CIT	AD300-R04A-CIT	***Consult LEL table

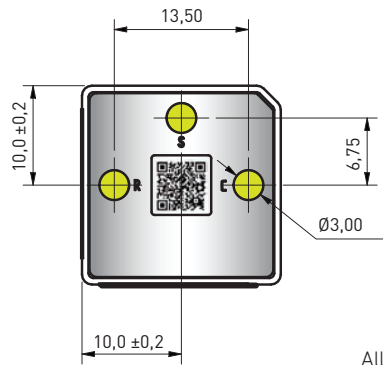
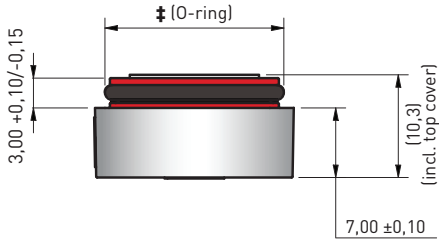
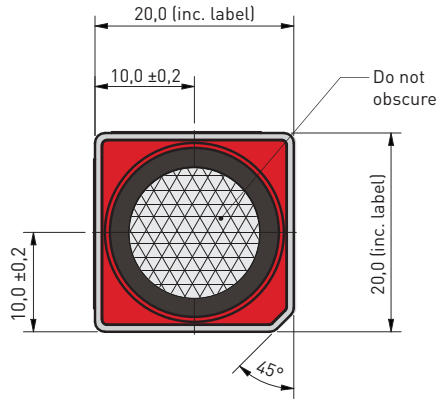
\*Specifications are valid at 20°C, 50% RH, and 1013 mBar, using City Technology recommended circuitry. Performance characteristics outline the performance of sensors supplied within the first three months. Output signal can drift below the lower limit over time.

\*\* Depends on environmental conditions

#### \*\*\*LEL Table

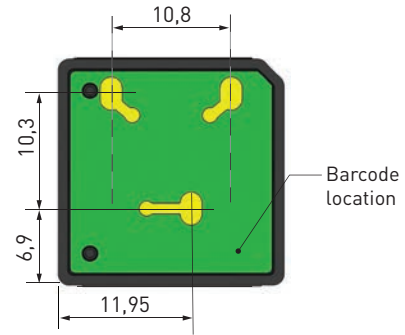
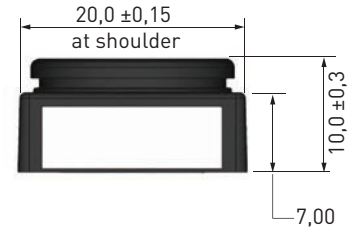
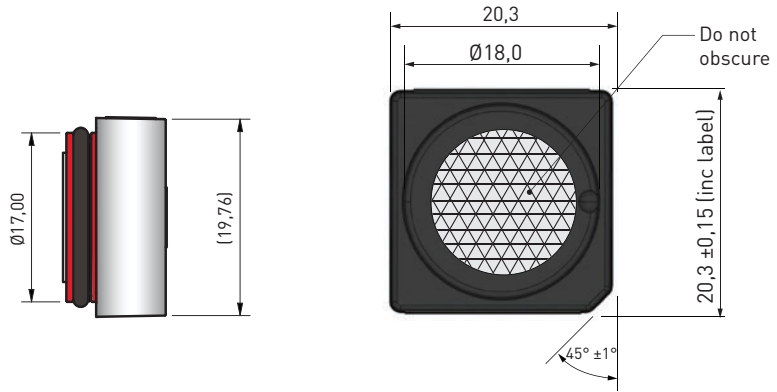
Sensor	1LEL75	1LEL75C	1LEL75M
<b>Target Gas</b>	Combustible gases and vapours	Combustible gases and vapours up to C6	Methane and hydrogen
<b>Inboard Filter</b>	To remove H <sub>2</sub> S	To remove H <sub>2</sub> S	To remove H <sub>2</sub> S
<b>Additional Filter</b>	None	Silica filter to improve silicone resistance	Carbon cloth filter to improve silicone resistance
<b>Catalog Listings</b>	PM979-600-CIT	PM989-600-CIT	PM999-600-CIT

## 1CO, 1H<sub>2</sub>S, 1O<sub>2</sub>, 1SO<sub>2</sub> Product Dimensions



‡ For mounting and sealing around sensor, refer to diagram on page 5 of this brochure.

## 1LEL Product Dimensions



All dimensions in mm. All tolerances  $\pm 0.15$  mm unless otherwise stated.

## Pinout

Pin	Label	Description
1	S	Sensing electrode
2	R	Reference electrode
3	C	Counter electrode

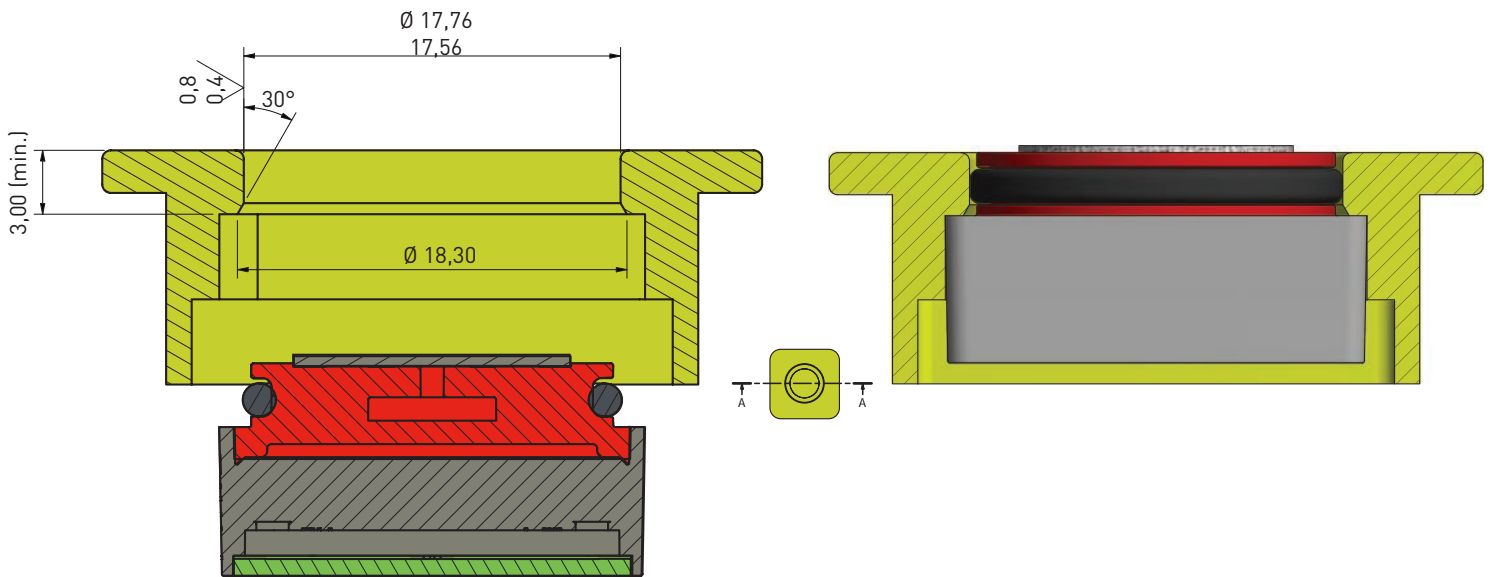
## LEL Electrical Specifications

Description	Measure
<b>Operating Voltage</b>	3.3 Vdc $\pm 0.05$ Vdc
<b>Operating Current</b>	84 mA max.
<b>Power Requirement</b>	280 mW max.

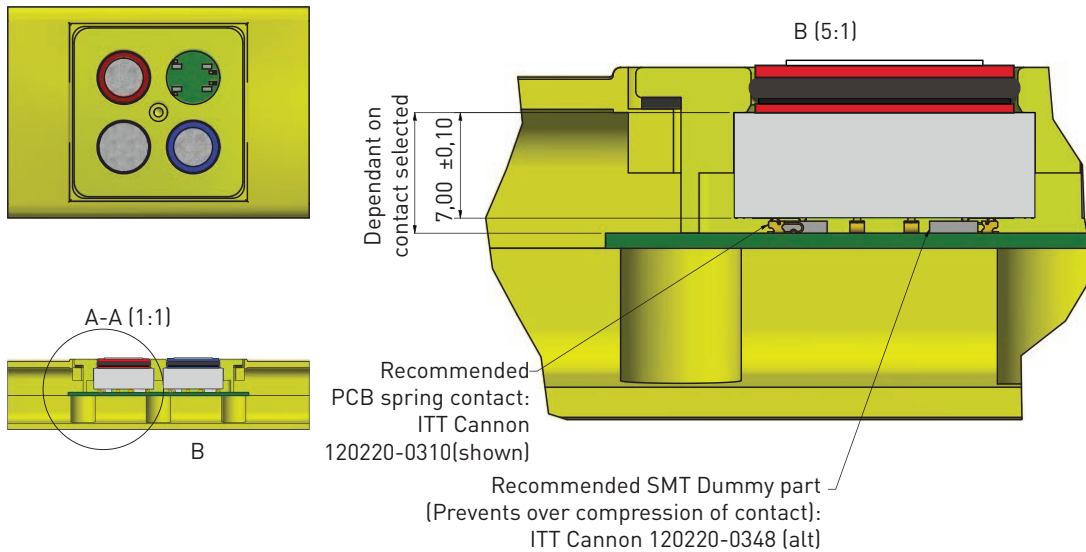
# COMPACT. PROVEN. FUTURE-PROOF.



## Recommended Sensor Integration into the Instrument:



## PCB Mounting



\* Sensor turret provides IP68 sealing.

## 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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