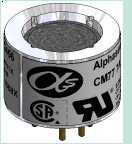




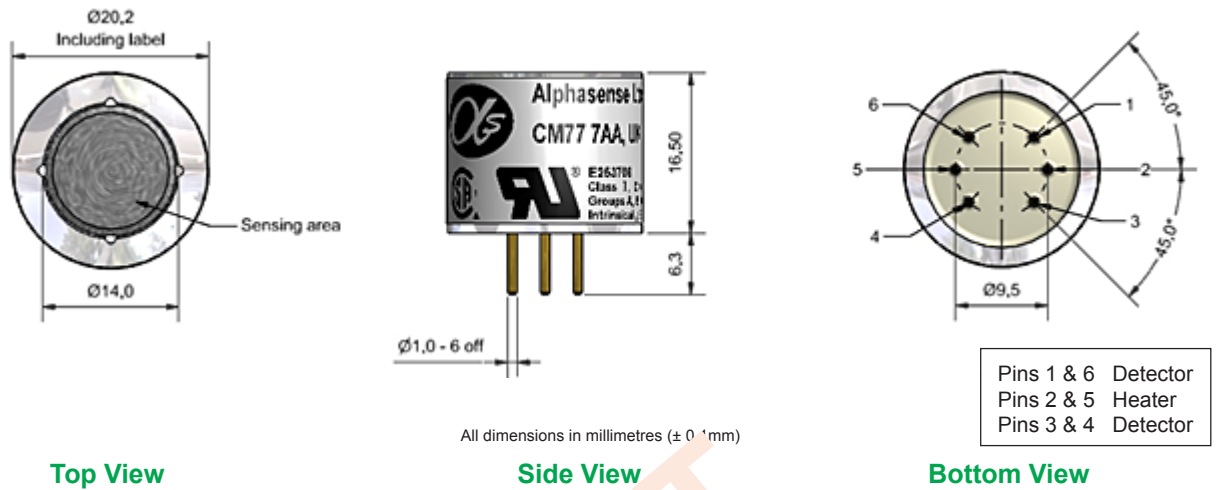
VOC Sensor

Metal Oxide Technology

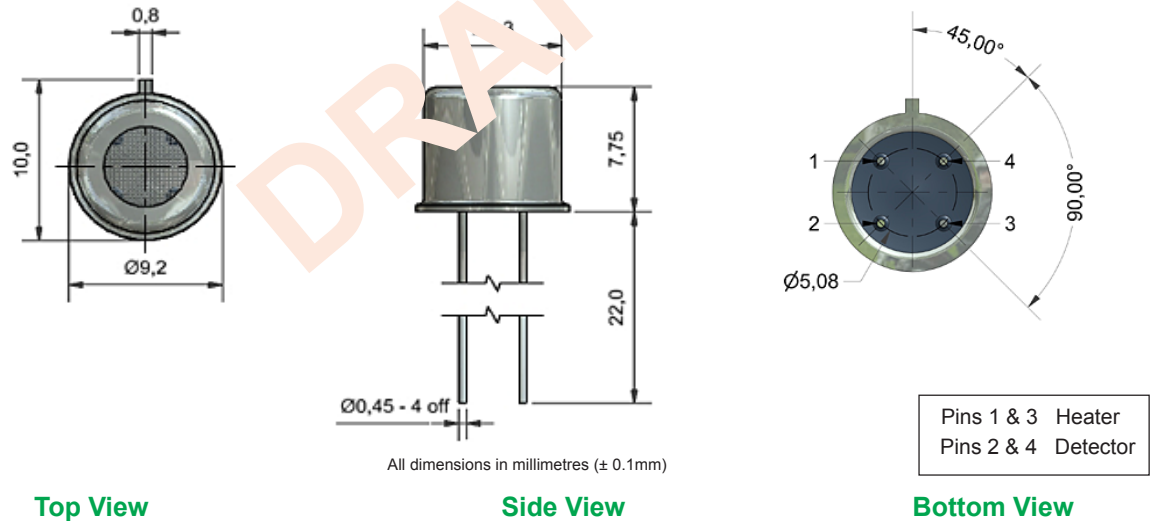


Technical Specification

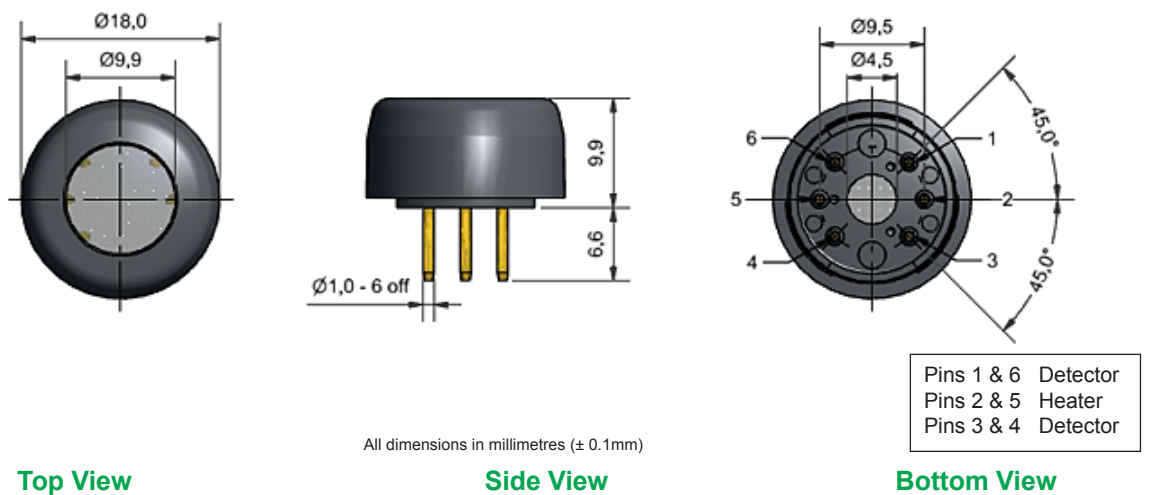
VOC-A11 Figure 1 Schematic Diagram



VOC-M11 Figure 2 Schematic Diagram



VOC-P11 Figure 3 Schematic Diagram





VOC Performance Data

Technical Specification

GENERAL DESCRIPTION

The p-type metal oxide gas sensor is sensitive to VOCs. It has a large dynamic detection range, and gives a composite response in the presence of multiple gases. It also has low humidity response. The sensor is thermally cycled* to provide a stable response. The measured resistance increases in the presence of typical reducing gases; this change in conductivity can be converted to an output voltage via a simple electrical circuit.

*The sensor is operated to alternate repeatedly between 400°C (the sensing temperature) and 525°C (the reset temperature). In this way, the exposure time in VOC is fixed at the dwell time at 400°C. The dwell time is determined by the detection range required by the end user. For further advice, please contact Technical Support.

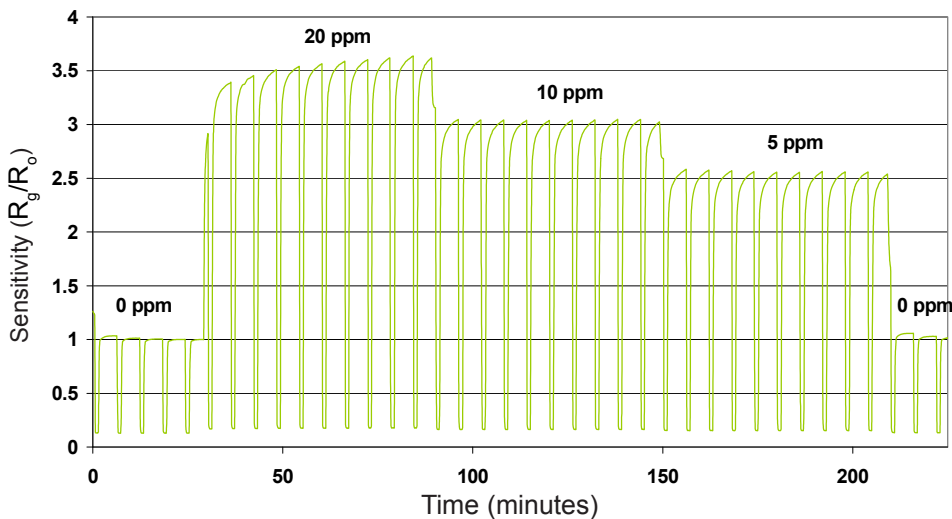
PERFORMANCE

Range	ppm isobutylene limit of performance warranty	1 to 100
Sensor resistance (R_o)	k Ω (humid air)	230 \pm 30
Sensor resistance (R_g)	k Ω ; Isobutylene @ 10ppm in air	600 \pm 50
Sensor resistance ratio ($R_g/R_o \times 100\%$)	%; Isobutylene @ 10ppm in air	260 \pm 40
Gas response relationship ($R_g/R_o - 1 = \sum k_i \times \text{Conc}^n$) where k_i = constant for gas i, n = 1 or 0.5	k is ppm ⁻¹ ; power n is dimensionless ; Conc. is ppm	0.05 +/- 10% (k for isobutylene) 0.5 (n for isobutylene)
Heater resistance (R_H at RT)	Ω (23 \pm 1°C)	10 \pm 1.5
Heater resistance (R_H at sensing temp.)	Ω (400 \pm 10°C)	22 \pm 3
Heater resistance (R_H at reset temp.)	Ω (525 \pm 10°C)	26 \pm 3
Heater power consumption (mW) typical for 5:1	$V_H = 2.7 \pm 0.2V$ (400°C) $3.7 \pm 0.3V$ (525°C)	340 \pm 30 530 \pm 50
Operating Temperature Range	°C	-20 to 120

SENSITIVITY TO OTHER GASES

EtOH sensitivity	% measured gas @ 10 ppm EtOH	< 15 ppm
C ₃ H ₈ sensitivity	% measured gas @ 500 ppm C ₃ H ₈	< 5 ppm

Figure 4 Real-time sensitivity as a function of Concentration



Sensitivity towards 20, 10 and 5 ppm Isobutylene in 50% rh. Sensor operating in 2-temperature mode, pulsing between 400°C for 5 mins and 525°C for 1 min.



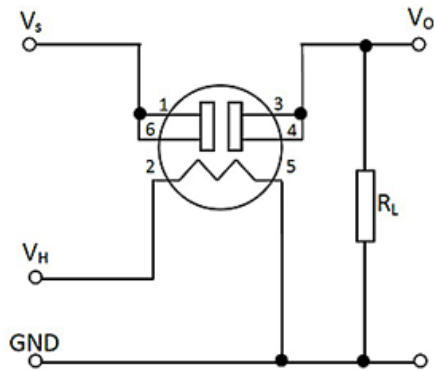
At the end of the product's life, do not dispose of any electronic sensor, component or instrument in the domestic waste, but contact the instrument manufacturer, Alphasense or its distributor for disposal instructions.

For further information on the performance of this sensor, on other sensors in our range, please contact Alphasense Ltd.



VOC Performance Data

Figure 5 Basic Measuring Circuit for VOC-A11 and VOC-P11 package



Pins on the measuring circuit, shown in Figure 5, correspond with the pin numbers in Figure 1, 2 & 3 above.

When the sensor is connected in this half Wheatstone bridge configuration, V_o decreases as the sensing material resistance increases.

- Heater Voltage (V_H) 2.7 ± 0.2 V (AC or DC)
- Circuit Voltage (V_S) Max. 24 VDC
- Load Resistance (R_L) $> 1k \Omega$

VOC-A11 EXPLOSION PROOF CERTIFICATION

This certification does not apply to VOC-M11 or VOC-P11

CERTIFICATION

Sira 07ATEX
1088X



II 2 G
Ex d IIC T4
-40°C to 50°C
5V, 1.25 W

IECEX SIR07.0031X

Ex d IIC T4
5Vrc, 1.25 W, T_a -40° to 50°C

UL913 091007-E253708

Class I, II and III, Division 1
10 V, 1.5 W, 10 μ H

CSA 22.2 1906313

Class 4828 31

SPECIAL CONDITIONS FOR SAFE USE (denoted by X after the certificate number)

The non-metallic parts of the Flameproof Sensor Housings shall only be installed in enclosures that offer protection from mechanical impact damage and shall not be exposed to ultraviolet radiation.

The final installation of the Flameproof Sensor Housings shall ensure that any likely damage from dropping the complete device has been considered.

The Flameproof Sensor Housings shall only be connected to an electrical supply that is certified as compliant with IEC 60079-11 and limited to the following: Type D - 5 Vdc, 1.25 W

DRAFT