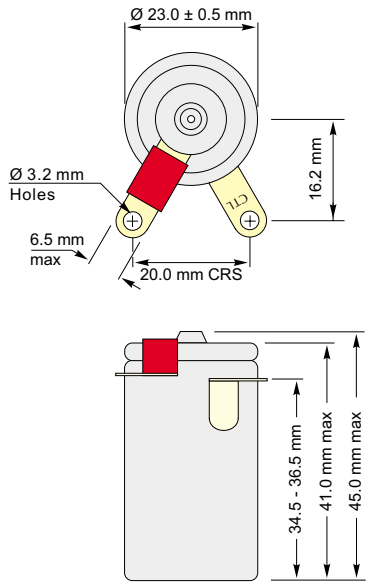
C/Y OXYGEN SENSOR

Performance Characteristics

Nominal Range	0-25% Oxygen
Max Overload	30% Oxygen
Expected Operating Life	One year in air
Output Signal	0.80 ± 0.12mA in air
T_{95} Response Time	≤10 seconds
Temperature Range	-20°C to +50°C
Temperature Coefficient	0.2% signal/°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	0.015% signal/mBar
Operating Humidity	0 to 99% RH non-condensing
Long Term Output Drift	<5% signal loss/year
Recommended Load resistor	47Ω
Storage Life	Six months in original container
Recommended Storage Temperature	0-20°C
Warranty Period	12 months from date of despatch



All tolerances ±0.15mm unless otherwise stated.

Linearity

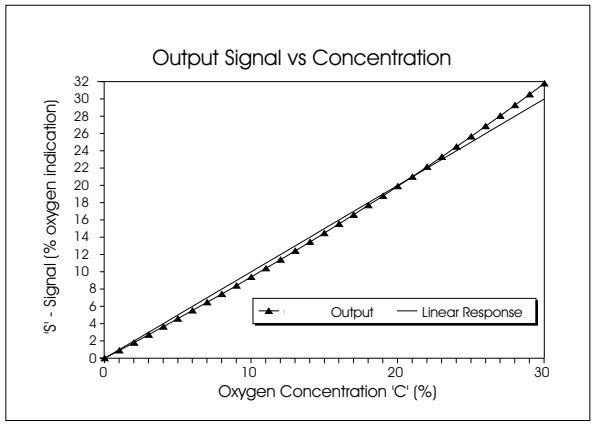
The output signal of an Oxygen C/Y follows the relationship:

$$S = K \log_e 1/(1-C)$$

where:

S = Output signal;
C = Fractional oxygen concentration;
K = a constant for the sensor.

For most applications the deviation from a linear response will be insignificant, and no compensation needed. For example, the graph oppisite shows the output of a sensor calibrated in air (20.9% O_2). In this case the maximum error in the 0-25% range is ≈0.5% at around 10% O_2.



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Temperature Behaviour

1) Gradual changes

The output of an Oxygen sensor varies slightly with gradual temperature changes. The behaviour of a batch of C/Y sensors is shown below. Output was measured at a range of temperatures and expressed as a percentage of the signal at 20°C. The graph shows the mean signal and three times standard deviation.

2) Sharp fluctuations

A transient response will occur with sharp fluctuations in temperature. For rapid increases in temperature there is a sharp drop in sensor output, and a sharp increase in output for rapid decreases. These responses are transient and should die away in about 20 seconds.