CGS500 Thermocatalytic Gas Sensors

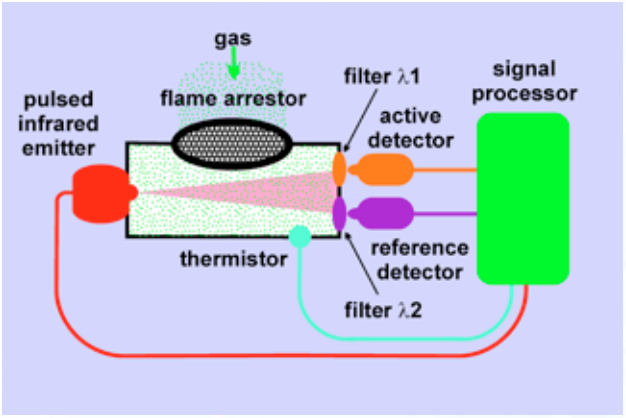
- **Temperature compensated**
- **Low drift**
- **Improved poison resistance**
- **Long life**
- **Fast response time**
- **Rugged stainless steel body**
- **Detects combustible gases and solvents**
- **Many accessories available**
- **ATEX II 2 G Exd IIC T6 Ta -40°C to +60°C**

The CGS500 combustible gas sensor has been designed to measure concentrations of combustible gases in the range 0-100% LEL. The CGS500 is available as a sensor only or fitted in an Exe certified junction box.

Each sensor contains two thermocatalytic elements. Combustible gases will oxidise on the surface of the active element while the reference element compensates for changes in temperature, pressure etc. Each element consists of a coil of fine platinum wire surrounded by an alumina based substrate containing a catalyst.

An electric current is passed through the elements which raises the temperature to a level where oxidation will occur. The catalyst reduces the temperature at which oxidation occurs, thus prolonging the life of the elements and resulting in much lower power consumption.

The CGS500 sensor is available with alternative elements. The CGS500-300N is general purpose robust sensor. The CGS500-300P has enhanced poison resistance and the CGS500-VQ41 is optimised for monitoring concentrations of ammonia and kerosene.



CGS500-IR NDIR Gas Sensor

- **Temperature compensated**
- **Low drift**
- **Not affected by catalytic poisons**
- **Wheatstone Bridge (pellistor) compatible**
- **Sensor MTBF of 10 years**
- **Fast response time**
- **Rugged stainless steel body**
- **Detects most hydrocarbons**
- **Many accessories available**
- **ATEX II 2 G Exd IIC T6 Ta -40°C to +60°C**

The CGS500-IR sensor is a NDIR (non dispersive infrared) sensor designed to replace thermocatalytic gas sensors for monitoring hydrocarbon gases in the range 0-100% LEL. The CGS500-IR-CO2 is available to monitor CO_2 in the range 0-5%. Both sensors are available as sensor only or fitted in an Exe certified junction box.

The CGS500-IR uses advanced miniaturised NDIR technology combined with surface-mount microprocessor and firmware technology. A pulsed infrared source emits a broad spectrum infrared beam within an optical cavity. The system measures the absorption of infrared energy as it passes through a gas sample. Different gases have clearly defined absorption characteristics, their concentration can be determined by their absorption of infrared radiation at the wavelength determined by filter lambda 1 in the diagram.

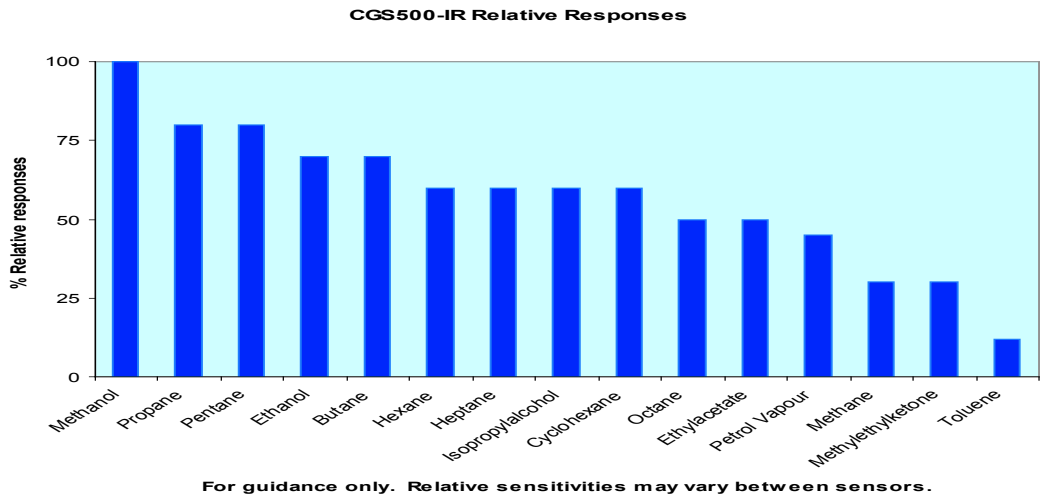
To compensate for interfering factors filter lambda 2 isolates another wavelength which is used to measure the total transmission through the optical cavity and is not affected by the gas being monitored. By comparing the infrared energy reaching each of the two detectors, the concentration of the gas sample can be determined. The signal processor compares and linearises these two signals. A thermistor monitors the sensor temperature and the signal processor factors in variations caused by temperature changes.

CGS500-300P & CGS500-300N Thermocatalytic Gas Sensor Specifications

Operating voltage and current	*2.05Vdc ± 0.05Vdc @ 300mA*
Detection range	*0-100% LEL*
T90 response time	*< 30 seconds*
Stabilisation time	*1 minute (preconditioning time, 1 hour)*
Operating temperature range	*-40°C to +60°C*
Repeatability	*±3% LEL CH_4 at 20°C*
Zero drift	*±2% LEL CH_4 per month at 20°C, S.T.P. continuous duty in air*
Linearity	*±5% LEL CH_4 at 20°C over range 0-100% LEL*
Humidity range	*5% to 95% RH non-condensing*
Sensor bridge output	*40mv at 100% LEL methane (typical)*
Typical sensor life	*3 to 5 years*
Threads	*Mounting thread: M25 X 1.5mm Accessory thread M42 x 1.5mm*
Weight	*Sensor: 400g Standard junction box: 300g*
Size of junction box (excluding sensor)	*W: 75mm, D: 58mm, H: 80mm*
Electromagnetic Conformance (EMC)	*Complies with EN50081 and EN50082*
ATEX certification	*II 2 G Exd IIC T6 -40°C to +60°C (Certificate No. BAS00ATEX2246X/1)*

CGS500-IR-HC (CGS500-IR-CO2) NDIR Gas Sensor Specifications

Operating voltage and current	*3.8Vdc @ 100mA (Minimum operating voltage 3.0Vdc - maximum 5.0Vdc)*
Detection range	*0-100% LEL (CGS500-IR-CO2 also available to monitor 0-5% CO_2)*
T90 response time	*< 30 seconds (<45 seconds for CGS500-IR-CO2)*
Stabilisation time	*1 minute (preconditioning time, 1 hour)*
Operating temperature range	*-30°C to +55°C*
Repeatability	*±2% LEL CH_4 at 20°C (±0.1% CO_2 at 20°C for CGS500-IR-CO2)*
Drift	*±1% LEL CH_4 per month at 20°C, S.T.P. continuous duty in air*
Linearity	*±5% LEL CH_4 at 20°C over range 0-100% LEL (±0.25% for CGS500-IR-CO2)*
Humidity range	*5% to 95% RH non-condensing*
Sensor bridge output	*60mv at 100%LEL methane (60mV at 5% CO_2 for CGS500-IR-CO2)*
Sensor MTBF	*10 years (calculations based on MIL-HDBK-217F)*
Threads	*Mounting thread: M25 X 1.5mm Accessory thread M42 x 1.5mm*
Weight	*Sensor: 420g Standard junction box: 300g*
Size of junction box (excluding sensor)	*W: 75mm, D: 58mm, H: 80mm*
Electromagnetic Conformance (EMC)	*Complies with EN50081 and EN50082*
ATEX certification	*II 2 G Exd IIC T6 Ta -40°C to +60°C (Certificate No. BAS00ATEX2246X/1)*



For guidance only. Relative sensitivities may vary between sensors.

Wiring details

Red	Active
Grey	Junction
Black	Reference

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