

# GGG GasClam® Instrumentation Overview & Deployment Information



## Introduction

GGG GasClam® instruments are high frequency in-situ borehole gas monitoring devices, suitable for detection of a wide range of ground gases commonly found in borehole monitoring. The equipment is ATEX approved and IP68 rated and can operate safely in explosive atmospheres and survive flooding environments. They can also be secured to building walls or placed internally to monitor sub-floor spaces or indoor air.

GGG currently have three versions of the instrument, a bulk gas version which monitors methane, carbon dioxide and oxygen; a trace gas version which also includes sensors for hydrogen sulphide, carbon monoxide and total volatile organic compounds; and a specialized instrument that can monitor methane and carbon dioxide between 0 – 5%v/v at a high resolution of 0.05% in addition to the other gases. All versions record atmospheric pressure, borehole pressure and temperature as standard.

Should your site be influenced by water level changes (e.g. tidal or flooding), GGS can also provide water level logging alongside the high frequency ground gas data if required.

## GasClam® Sensor Specifications, Service and Maintenance

The GGS GasClam® instruments are serviced and calibrated annually. Routine maintenance including the replacement of filters and operational checks are carried out at regular intervals and prior to deployment at a site. Copies of the calibration certificates for the instruments used on site are included as standard within reporting. Details of the sensor specification are provided below:

Sensor	Method / Type	Range	Resolution
Methane (0-100%)	Infrared	0 - 100%v/v	1% of measuring range above 50%, 0.5% below 50%
*Methane (0-5%)	Infrared	0-5%v/v	0.05%
Carbon Dioxide (0-100%)	Infrared	0 - 100%v/v	1% of measuring range above 50%, 0.5% below 50%
*Carbon Dioxide (0-5%)	Infrared	0-5%v/v	0.05%
Oxygen	Electrochemical	0 - 25%v/v	0.1%
*Hydrogen Sulphide	Electrochemical	0 - 100ppmv	1ppmv
*Carbon Monoxide	Electrochemical	0 - 1000ppmv	1ppmv
*Total Volatile Organic Compounds	PID	0 - 4000ppmv	1ppmv
Atmospheric Pressure	Piezoelectric	800 - 1200mb	1mBar
Borehole Pressure	Piezoelectric	800 - 1200mb	1mBar
Temperature	Internal chip	-5°C to +50°C	1°C

\* Only installed on the 0-5% High Resolution GasClam® \* Only installed in VOC GasClam®

The GGS GasClam® equipment is battery powered and runs off two D cell batteries. The bulk gas versions can take approximately 1350 readings (approximately 8 weeks based on hourly sampling), with the other versions taking approximately 600 readings (approximately 3.5 weeks based on hourly sampling) before the batteries need replacing.

## Deployment Requirements (IMPORTANT)

For GGS GasClam® instruments to be deployed, standard 50mm installation standpipes are required (larger diameter boreholes can be accommodated for). Headworks with enough clearance and a suitable secure cover are also required. GGS recommend that a minimum 8 inch diameter flush fit cover (for example MW8 covers available from Stuart Wells <http://wellservices.stuartgroup.ltd.uk/>) be used. A minimum 100mm clearance is required from the top of the 50mm standpipe to the underside of the cover. A minimum 150mm internal headworks diameter is required (75mm clear radius from centre of stand pipe). We also recommend that minimum standing water level is greater than 0.8m below the standpipe top due to the instrument halting gas sampling automatically to avoid taking water internally.

GGG can also deploy GasClam® instruments within buildings or fix them to external walls within protective and secure housing should you wish to monitor indoor air or subfloor void spaces of existing buildings or for verification purposes.

If the above requirements cannot be achieved, please contact GGS to discuss site specific deployment options – there probably is one!

## GasClam Insurance

GGG carry specific insurance to cover the instruments against theft from site and is included as standard as part of our service.

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