

Gas Data GFM436

Leading the field for gas measurements in site investigations, landfill gas control and environmental regulation compliance monitoring

The **Gas Data GFM436** is an ATEX and MCERTS accredited hand-held gas analyser designed specifically for monitoring and analysing soil gas parameters during site investigations of greenfield, brownfield and land affected by landfill operations or other industrial contamination. Operation is extremely simple, yet the readings obtained are comprehensive and accurate. The instrument uses Gas Data's proprietary NDIR (non-dispersive infra-red) sensors and a combination of industry standard sensors and transducers for the other parameters.

It is lightweight, small and robustly constructed with a weather resistant case making it perfect for use in the most challenging of field conditions. It first measures the proportion of methane (by volume and LEL), carbon dioxide, oxygen, hydrogen sulphide and carbon monoxide in the soil gas.

Should the methane readings be above normal levels caused by bio-degradation then it is likely that the soil gas contains other hydrocarbon vapours (from spilt fuels, oils or other contaminants). A standard analyser would be unable to evaluate these but the **GFM436** has a second infra-red scale referenced to hexane vapour. This allows the **GFM436** to respond in a more accurate and predictable way because hexane has an infra-red absorption characteristic that closely matches those of typical fuel and oil vapours. By reading from this second scale erroneous or even over-range methane results, that could be meaningless, are avoided and replaced with readings referenced to hexane instead.

The **GFM436** is designed to enhance the usefulness and accuracy of commonly used PID's (photo-ionisation detectors). PID's are the industry standard device for quantifying low level VOC's (volatile organic compounds) in soil gas but they have an inherent weakness in that their calibration is greatly affected by the presence of methane. The **GFM436** automatically reads out the necessary multiplication factor (PID Compensation Factor) that must be applied by the user to the readings taken from the PID before they are recorded. After this factor is applied, the PID reading is now accurately compensated for the error caused by the presence of methane. Without this compensation the PID readings may be grossly inaccurate and misleading.

A second group of measurements define the physical parameters of the gas such as its pressure, flow rate and temperature which can also be easily measured in the field using the **GFM436**. An internal high-precision thermal mass flow transducer directly measures the flow of gas either out of or into the monitoring borehole (bi-directional flow). The flow is displayed as two readings. One is the instantaneous value, the other is the peak value. A secondary calibration of this transducer is used to dynamically indicate the precise difference between the gas pressure inside the borehole and the air pressure outside (Atmospheric pressure) down to only a few Pascals. This is done whilst the gas is still flowing.

Two static silicone bridge pressure transducers are also built into the **GFM436**, one to determine atmospheric pressure and the other is used to measure the static pressure in the borehole in situations where the site utilises a network of vacuum pipes connected to the boreholes in order to safely extract the gases (gas extraction system). Using the static pressure channel to measure the vacuum at different points in the gas extraction system the **GFM436** can also be used to assist in the setting of control valves and gas pumps (gas balancing).



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Finally, by using the multi-way connector on the top of the instrument, an optional temperature sensor can be plugged in for the general purpose gas temperature measurements, or alternatively a vane anemometer to measure the velocity in a gas extraction system pipeline.

Data storage is standard in the **GFM436**. All measured values and manually entered water levels from a Dip Meter can be stored for later viewing and/or download to a PC. When stored, the values are time stamped and labeled. The label has a three tier format and can be up to 24 alphanumeric characters long. The data is held in non-volatile battery-independent FLASH memory with a capacity of over 3000 complete data sets.

Using Gas Data's SiteMan5 program data and labels can be easily transferred to and from a PC via the supplied USB connection cable. Data storage can be triggered manually or the internal real time clock can be programmed to take and store readings automatically while the instrument is left unattended.

The **GFM436** has a user-exchangeable and rechargeable NiMH (Nickel Metal Hydride) battery pack providing typically eight hours field use between charges. A universal input mains battery charger is supplied in the instrument kit. Additional battery packs and an in car 12V DC powered charger are also available as optional extras.



The **GFM436** leads in its class with many outstanding features:

- **Small portable design which is easy to carry and hold in the hand with an 8hr battery life.**
- **Supplied in 'ready to go to site' kit.**
- **Intrinsically safe - ATEX certified.**
- **MCERTs accredited for both gas and flow measurements.**
- **Bright LCD display offering excellent readability from darkness to sunlight.**
- **Intuitive operator buttons, screen layouts and SiteMan 5.xx PC software**
- **Provides measurement of 6 gases - CH₄, CO₂, O₂, H₂S, CO and Hexane.**
- **Displays LEL and determines a PID compensation factor for use with PID instruments.**
- **Bi-directional measurement of instantaneous and peak borehole flow.**
- **Measurement of atmospheric, dynamic differential and static pressure.**
- **Manual entry of water levels from a Dip Meter taken at each borehole – 2 readings can be stored for each borehole location.**
- **3 tier hierarchical 24 character alphanumeric labels for the naming of stored reading sets.**
- **Manual data storage and programmable unattended data logging functions.**
- **Battery independent FLASH memory of over 3000 readings storage capacity.**
- **Data can be downloaded via USB and can be exported in CSV or AGV 3.1/4 format.**
- **12 month recalibration interval.**
- **Field exchangeable battery pack.**



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Gas Data GFM436 Technical Specification

General		
Ex Rating to	EEx ib IIB T1	
Ambient Temperature Range	-10 deg C to 40 deg C	
Battery Life	8 hours typical	
Battery Charge Time	4 hours maximum	
Aspiration Rate	300 ml/min minimum	
Storage Capacity	>3000 readings	
Protection Rating	IP65	
Dimension	200mm x 100mm x 60mm (approx.)	
Weight	800g (approx.)	
Standard Channels		
	Range (resolution)	Typical Accuracy
Gas Measurements		
Methane	0 to 100% (0.1)	0.3% @ 5% 3.0% @ 60% 3.0% @ 100%
LEL	0 to 100% LEL (0.1)	4% LEL
Carbon Dioxide	0 to 100% (0.1)	0.3% @ 5% 3.0% @ 40% 3.0% @ 100%
Hexane	0 to 2,000ppm (10)	0.2%
Oxygen	0 to 25%	0.2%
Hydrogen Sulphide	5,000ppm (10.0)	20ppm
Carbon Monoxide	2,000ppm (1.0)	20ppm
Pressure Measurements		
Atmospheric	800 to 1200mbar (1)	2mbar
Static	-200mbar to 200mbar (1)	0.5mbar
Differential	+1250Pa to -1250Pa	3Pa to 250Pa (see calibration certificate)
Flow Measurements		
Instantaneous Flow	+100 to -60l/hr	0.1l/hr to 3l/hr (see calibration certificate)
Peak Flow Display	Yes	
Specialist Channels		
PID Compensation Factor		
Standard Accessories Supplied		
Battery charger, leather carry case, hard transit, sample pipes, spare filters (c/w fitting tool and spare screws), USB comms cable, USB memory stick containing Siteman 5.xx PC software and manual, laminated quick reference card, calibration certificate		
Optional External Sensors		
Temperature	-10 degC to 100 degC (0.1)	1.0 degC
Gas Velocity	0 - 40 m/s (0.1)	0.5 m/s



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