

# ORBITAL GAS SYSTEMS

GASPT - SENSOR UNITS & SAFETY INTERFACES



Integrated GasPT® and VE  
Technology® Sample System  
GasPTi (TDS 007)



GasPT®  
Safety Interfaces  
MI & AI



GasPT®  
Sensor Units  
MU & AU

“GasPT® redefines the standards for fast, accurate and inexpensive measurement of Natural Gas properties. Innovative equipment for energy measurement, process control, gas turbine control, LNG monitoring and other applications.”

## GASPT

SENSOR UNITS & SAFETY INTERFACES

### GasPT® Sensor Units

The GasPT is a small, fast and accurate online gas analyzer, providing Calorific Value (BTU), Wobbe Index, Relative Density, Compressibility Factor and others. With an instrument update time from 2 seconds the GasPT calculates the key physical properties to  $\pm 0.5\%$  accuracy, revolutionizing gas quality measurement in the natural gas industry.

The 2-part gas analyzer comprises a Main Unit (MU) which houses the main processor and a CO<sub>2</sub> sensor, and the Ancillary Unit (AU) which accommodates an acoustic resonator to measure speed of sound and a thermal conductivity sensor. Note that both units have integrated temperature and pressure measurement.

The GasPT device derives a five-component equivalent composition of methane<sup>eff</sup>, ethane<sup>eff</sup>, propane<sup>eff</sup>, nitrogene<sup>eff</sup> and carbon dioxide. Using an extensive calibration process during manufacture, this equivalent composition can be used to accurately represent any Natural Gas mixture, without any ongoing calibration requirements. All of the higher hydrocarbons are resolved into the three “effective” hydrocarbons, by using complex and proprietary algorithms created by industry experts. From this effective composition the GasPT will calculate the key physical properties using ISO6976. Please note that properties outside of the standard gas properties table can also be calculated, dependent on the communications configuration.

### GasPT® Safety Interfaces

The safety interfaces (MI & AI) are primarily galvanic isolation devices that are capable of supplying DC power to the GasPT and provide Opto-isolation for the RS485 communications to and from the MU & AU.

The GasPT safety interfaces form the communications means between the GasPT and the end user’s equipment, whether that be a dedicated microcontroller, SCADA, DCS or PC.

### BENEFITS

- 1) Calorific value (BTU) error  $< \pm 0.5\%$ . Providing the ability to control processes and making it valid for critical measurements such as custody transfer (certified by NMI to OIML R140).
- 2) Instrument update time from 2 seconds. Reducing uncertainty by nearing real time data analysis, and revealing hidden peaks and troughs in gas quality.
- 3) No on-going analyzer maintenance or technical support needed. Optional annual validation, which is recommended once every 12 months.
- 4) No carrier or calibration gas, eliminating the cost of expensive civil works, certified gases and cylinder rental/storage/transport. Also, reducing the overall system footprint.

**SPECIFICATIONS - GasPT SENSOR UNITS**

Dimensions	190 mm (7.5") height x 60 mm (2.4") diameter – each unit		
Weight	Aluminium version: 1.6kg (3.5lbs) – weight per set (MU +AU) Stainless Steel version: 4.2kg (9.3 lbs) – weight per set (MU +AU).		
Maximum Inlet Pressure	0.3 Barg (30 Kpa / 4.3 Psig)		
Analysis Time	Instrument Update from 2 secs , T90 from 10 secs		
Accuracy	Error on CV and Wobbe on measured value better than ± 0.5%, as standard.		
Repeatability	CV and Wobbe ± 0.04MJ/m <sup>3</sup> (1.07Btu/ft <sup>3</sup> ) at ambient temperature		
Temperature Range	Storage and operation: -20 °C to + 50 °C (-4 °F to +122 °F). Quoted accuracy at -10 °C to + 40°C as stated by NMI (+14 °F to +104 °F)		
Power Consumption	Nominal Operation 6.8 Vdc, 250 mA, 1.7 Watts		
Certification	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>GasPT AU</b> Baseefa02ATEX0139X  II 1 G Ex ia IIB T4 Ga (-40 °C ≤ Ta ≤ +70 °C) IECEX BAS 12.0008X; Ex ia IIB T4 Ga (-40 °C ≤ Ta ≤ +70 °C)</p> <p> 11.2429362 Ex ia IIB T4 Ga Class I Zone 0 AEx ia IIB T4 Ga</p> <p><i>OIML R140 ed. 2007 Class A Instrument (&lt; ±0.5 % error on CV) – (NMI Type approval certificate TC 8670, NMI Parts Certificate TC11084) OFGEM approved as part of GasPTi (TDS 007)</i></p> </div> <div style="width: 45%;"> <p><b>GasPT MU</b> Baseefa10ATEX0176  II 1 G Ex db ia IIB T4 Gb (-20 °C ≤ Ta ≤ +55 °C) IECEX 10.0093; Ex db ia IIB T4 Gb (-20 °C ≤ Ta ≤ +55 °C)</p> <p> 11.2429362 Ex db ia IIB T4 Gb Class I Zone 1 A Ex db ia IIB T4 Gb</p> </div> </div>		
Operational Ranges	Methane: 50 - 100% Ethane: 0 – 15% Propane: 0 – 7% iso-butane: 0 – 1% n-butane: 0 – 1%	iso-pentane: 0 – 0.5% n-pentane: 0 – 0.5% Nitrogen: 0 – 10% (extended range available) C6+ total: 0 – 0.5% Carbon dioxide: 0 – 5% (no added cost 0 – 25%)	H <sub>2</sub> S: <5ppm He: trace levels only O <sub>2</sub> : trace levels only H <sub>2</sub> : trace levels only H <sub>2</sub> O: non-condensing
Material & Part Numbers	Aluminum: AU: 01000210-OGS MU: 01000211-OGS	Stainless Steel: AU: 01002528-OGS MU: 01002529-OGS	

**SPECIFICATIONS - GasPT SAFETY INTERFACES**

Dimensions	75 mm (3") x 55 mm (2.2") x 110 mm (4.3") – each unit		
Weight	0.5kg (1.1lb) – weight per set (MI +AI)		
Temperature Range	Operation: 0 °C to 50 °C (32 °F to 122 °F) Storage: -20 °C to 50° C (-4 °F to 122 °F)		
Supply Voltage	23.5VDC		
Certification	<p><b>GasPT Safety Interface Barriers</b> Baseefa10 ATEX 0157X &amp; 02ATEX0260X;  II (1)G [Ex ia Ga] IIB (-20 °C ≤ Ta ≤ +50 °C) IECEX BAS 10.0084X and IECEx BAS 12.0134X; [Ex ia Ga] IIB (-20 °C ≤ Ta ≤ +50 °C)</p> <p> 11.2429362 [Ex ia Ga] IIB [AEx ia Ga] IIB</p>		
Communications	RS485 Serial		
Protocols	MODBUS ASCII or RTU		
Part Numbers	AI: 00022184-OGS MI: 00022185-OGS	Note that the MI is only compatible with the MU and the AI is only compatible with the AU.	