THE ORBITAL WAY

Orbital's Value Statement pledges a commitment to acknowledge and honor our core values of Innovation, Safety, Service and Environment by developing and maintaining a culture that embraces these values.

Innovation – We intend to be at the leading edge of gas technology and challenge ourselves to develop and evolve gas solutions.

Safety – We place safety at the forefront of everything we do.

Service - We are committed to serving with the highest level of respect and integrity in the pursuit of building long-term relationships.

Environment – We value the environment and are committed to uphold, comply with and exceed industry regulations.

We are committed to all aspects of project delivery operating in a manner that minimizes any potential risk, promotes a positive HSE culture and protects our clients' personnel and capital assets.

Environmental protection and sustainability is a core value at Orbital and is central to our everyday operations. We understand the nature of our work could have an impact on the environment; therefore our designs are such to minimize waste, recycle waste, reduce environmental impact, decrease travel and optimize logistics.

ORBITAL
GAS SYSTEMS

INNOVATING GAS SOLUTIONS FOR FOCUSED ACCURACY

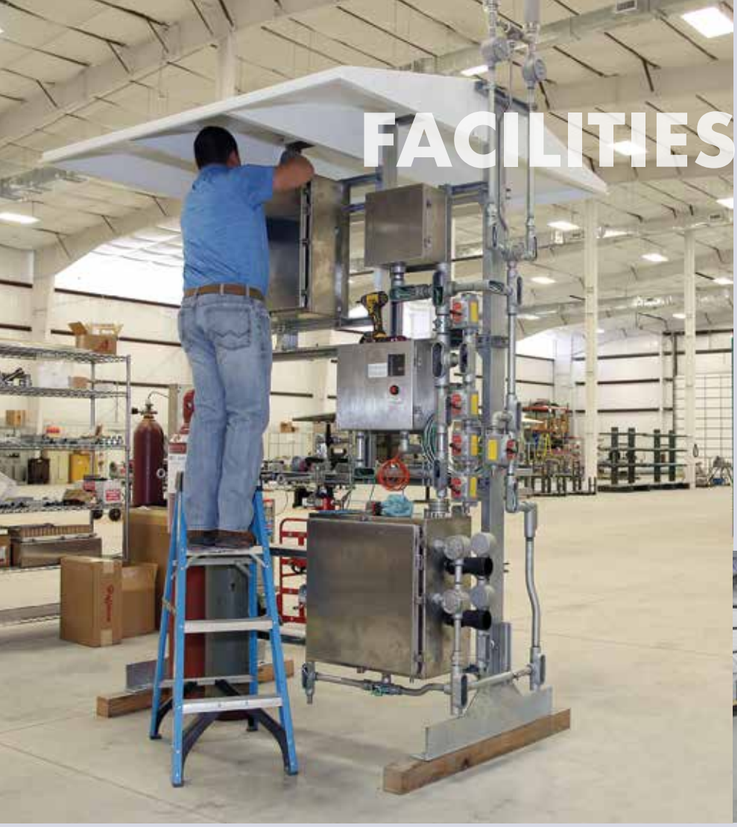
ORBITAL
GAS SYSTEMS
www.orbitalgas.com

Orbital has more than 100 years worth of industry experience, comprising analytical system integration and analytical application knowledge.

Orbital's workforce is made up of a carefully selected team of project management, project engineers, design engineers, fabrication specialists and testing experts that offer full professional support for the following services:

- *Front-end Engineering and Design*
- *Analytical Systems Integration*
- *Startup, commissioning & Field Services*
- *Field Installation Services*
- *Training*

ORBITAL
GAS SYSTEMS



FACILITIES

US Facility

- High Visibility on Beltway 8 Frontage
- 39,000 sq ft Facility
- Expandable Space to 55,000 sq ft
- 4 Acres of Property

UK Facility

- 4.5 Acre Site
- 46,000 sq ft Facility

FACILITIES

Since its formation in 1984, Orbital Gas Systems has provided unparalleled solutions to the global energy, power and processing markets, becoming the leader in engineering, design, installation and commissioning of industrial gas sampling, measurement and delivery systems. Operating globally, Orbital manufactures and delivers a broad range of applications including gas metering, process control, telemetry, gas sampling, environmental monitoring and BioMethane systems.

Orbital's UK facility features manufacturing, distribution and R&D centers; a GasPT calibration lab; and client "hot desks".

Orbital's new Houston facility supports the growth of these upstream, midstream and downstream product lines and services. The 35,000 ft² facility comprises 2+ acres of real-estate, and is currently ISO 9001:2015.

Some features of the new facility include: Climate control, instrument grade air supply, 480/220/110 VAC services, probe pressure testing capability, certified welding capacity, laser engraving and crane accessibility.

INTRODUCING ORBITAL

INNOVATIVE ANALYTICAL SOLUTIONS

Since its formation in 1984, Orbital Gas Systems has provided unparalleled solutions to the global energy, power and processing markets, becoming the leader in engineering, design, installation and commissioning of industrial gas sampling, measurement and delivery systems. Operating globally, Orbital manufactures and delivers a broad range of applications including gas metering, process control, telemetry, gas sampling, environmental monitoring and BioMethane systems.

Orbital is committed to fulfilling the requirements of its clients and the marketplace through innovation, experience and the intelligent application of new technologies. Our intent is to supply products and services that exceed the highest quality standards, represent the cutting edge of design and offer value beyond cost.

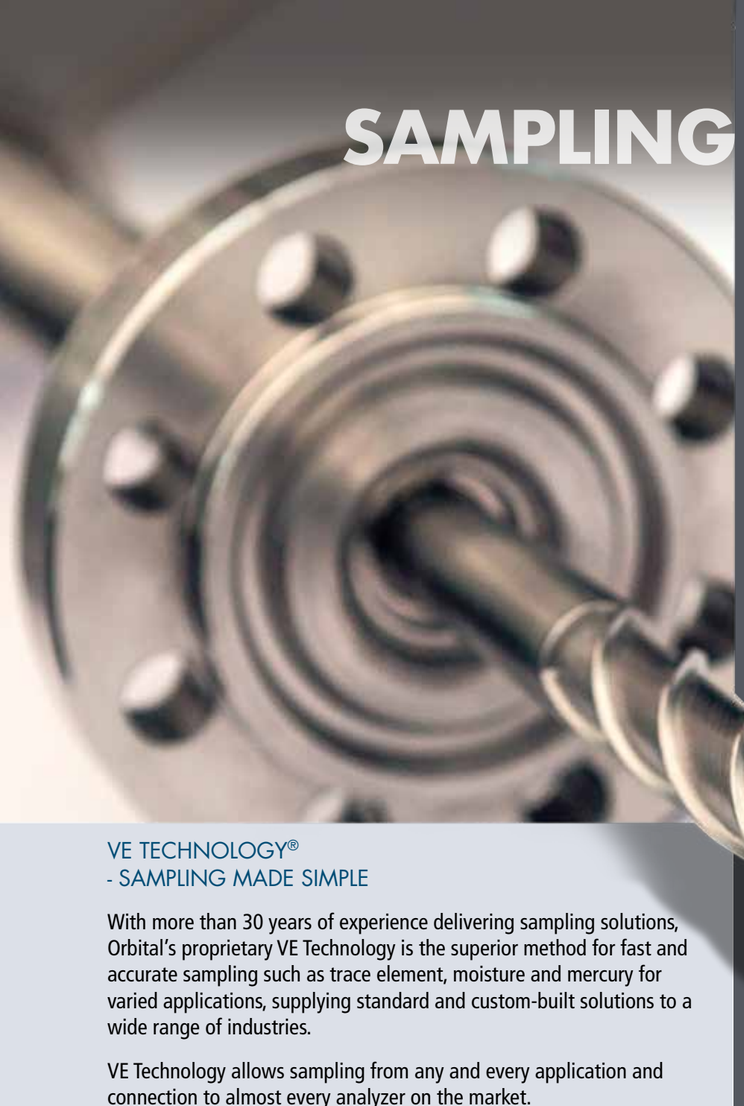
Orbital is Innovating Gas Solutions for Focused Accuracy - providing immediate access to critical information when you need it.

Orbital services a wide range of industries with a diverse range of applications:

- Natural Gas Distribution/ Custody Transfer/Process Control
- Petrochemical
- Chemical/specialty Chemical
- Refining
- CEMS/Environmental
- LNG
- Fracking Processes
- Pharmaceutical
- Utilities/Liquid sources
- Metal Manufacture and Processing

*For patent information for all Orbital technology, please visit www.orbitalgas.com/patents

SAMPLING



VE TECHNOLOGY®
- SAMPLING MADE SIMPLE

With more than 30 years of experience delivering sampling solutions, Orbital's proprietary VE Technology is the superior method for fast and accurate sampling such as trace element, moisture and mercury for varied applications, supplying standard and custom-built solutions to a wide range of industries.

VE Technology allows sampling from any and every application and connection to almost every analyzer on the market.
From the simple sample probe that eliminates the need for wake frequency calculations through to a complete, integrated sampling and analysis system, VE Technology® delivers world leading, patented solutions to the complexities involved in representative sampling.

Of utmost importance, VE Technology ensures a representative sample is delivered to your analyzer of choice in the fastest and most accurate manner while exceeding standards such as ISO 10715, GPA 2166 and API 14.1. Orbital is able to combat the battles associated with sampling high pressure, high velocity, particulate and droplet-contaminated process streams without corrupting the subsequent samples.

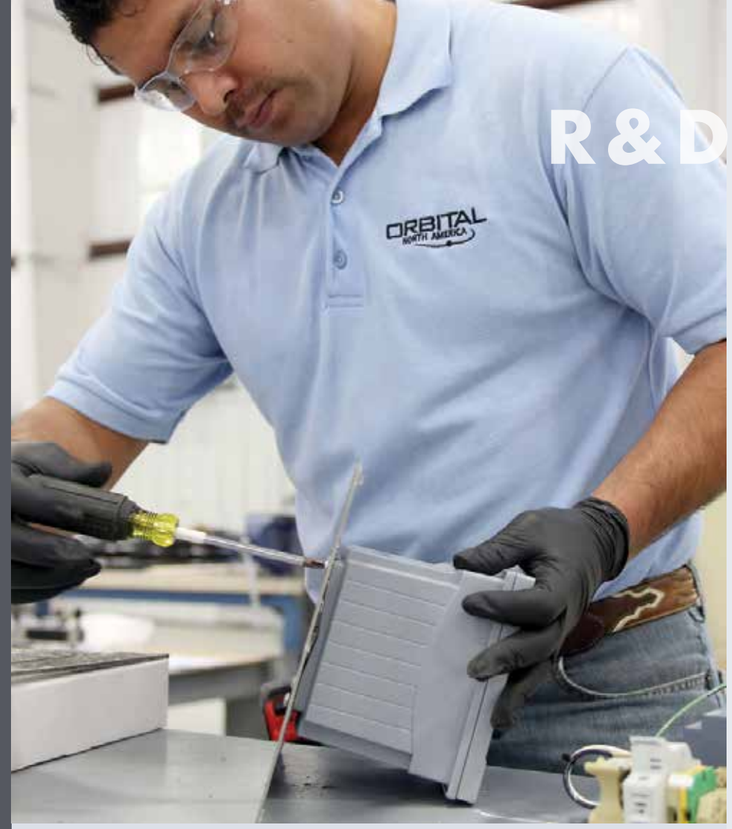
Maintaining sample identity:

1. Orbital's dynamic filtration rejects particulates and droplets, keeping your sample pathway clean, without collecting contamination on filters or membranes.
2. By eliminating the regular vortex shedding, the vortex induced vibration (VIV) is no longer a concern. Where conventional probes are hindered by VIV, VE Technology® probes can be inserted into the central 1/3 for truly representative sampling.
3. Joule-Thomson cooling during pressure reduction has the ability to change the phase of the sample; therefore Orbital ensures to look after the molecules rather than masking the problem.
4. Dead spaces, dead legs, cross sectional changes, poor surface finishes and threads are eliminated.
5. Sampling system volume is minimized to expedite response, reduce emissions and energy consumption.

Orbital's sampling system applications:

- Natural gas
- Trace element
- Moisture
- Mercury
- Oil
- Chemical
- Continuous automated and manual sample systems
- LNG sample systems
- Bespoke sample conditioning units
- VE sampling technology
- Full integrated sample and analysis systems
- High velocity, high pressure processes

R & D



RESEARCH & DEVELOPMENT

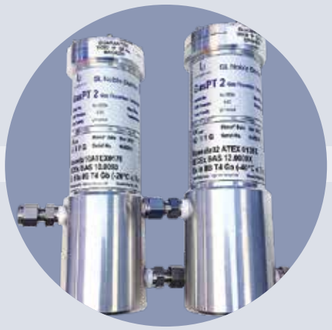
Orbital already sells market-leading technologies, that offer the kind of technical and commercial advantages that the industry is only just seeking to strive for. But the world doesn't stop moving!

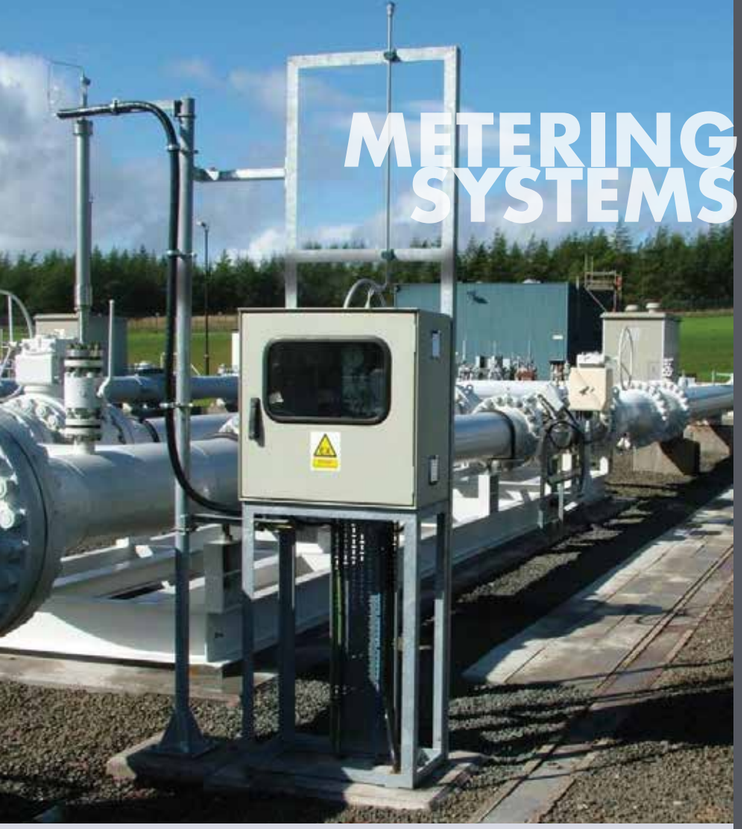
Orbital strongly believes in developing the solutions for tomorrow's problems, today. That's why we have heavily invested in R&D activities, to further develop our existing technology and to bring additional value to the hydrocarbon value chain through innovative solutions.

Through engagement with internationally-renowned industry experts and globally-significant industrial partners, our core team of technology experts can turn inspirational concepts and ideas into real industrial solutions.

Our team works closely with our integration and product teams, and directly with clients, to ensure requirements are well-understood, solutions are fit for purpose and performance exceeds expectations when it comes to practical application.

Continuously researching new solutions, Orbital is fully invested in the further evolution and development of market-leading technologies.





METERING SYSTEMS

METERING SYSTEMS

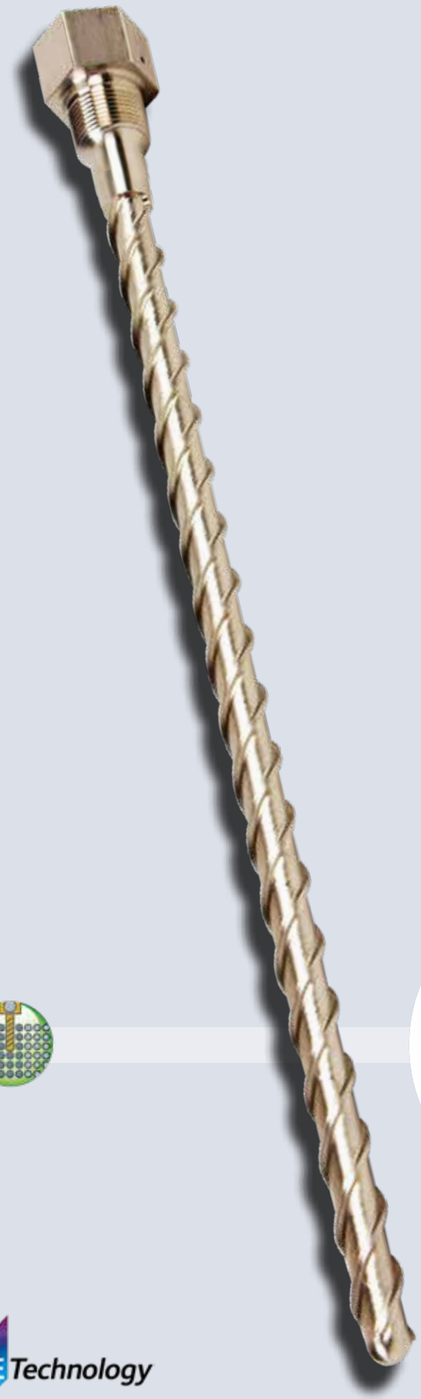
Orbital delivers metering systems that range from 2 in. to more than 48 in. size, and also provides analysis, sampling (see VE Sample Systems and VE Thermowells) and supervisory and control.

Orbital is specialized in producing metering systems that are comprehensive, durable and highly accurate – from small upgrades on existing metering systems to large national and global projects.

Orbital's metering systems applications:

- Onshore fiscal metering
- Offshore fiscal metering
- Liquid metering (e.g. LPG, Liquid Propane, LNG)
- Gas metering (e.g. natural gas and other fluids)
- Process control
- Safe and hazardous areas

SAMPLING

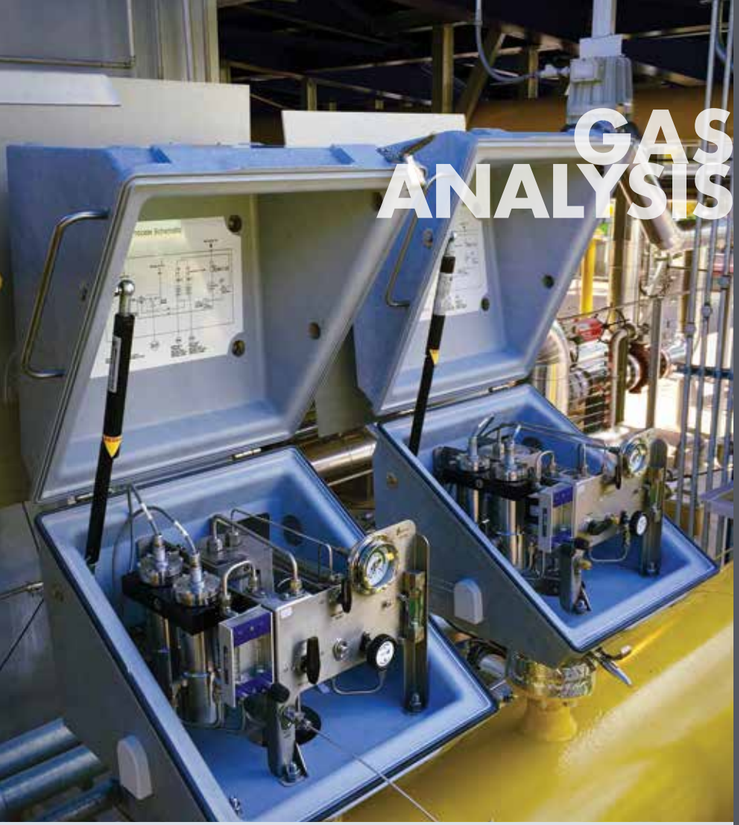


VE THERMOWELLS

The VE Thermowell has a radical patented design, included in all VE Technology sample probes, to provide best-ever safety and performance. Orbital machines a helical strake into the body of the probes, producing a design that has been meticulously researched and calculated to eliminate all vortex induced vibration.

Extensive wake calculations are no longer needed to ensure your equipment is safe from vortex induced vibrations, and concerns about VIV thermowell failure or a major pipeline failure caused by poor thermowell design are eliminated. Because the helical strake eliminates the regular vortex shedding effect, we can reduce the wall thickness of our thermowells. This means there is less thermal mass in Orbital's thermowells, which results in a much faster and more accurate temperature response. VE Thermowells are also machined with an aerodynamic tip, which minimizes flow disturbance, improves temperature response and eliminates tip vorticies. The elimination of VIV helps future proof your installation against process changes or increased throughput.

VE Technology



GAS ANALYSIS

GasPT® - IMMEDIATE ANALYSIS, ACCURATE RESULTS

For many years, the industry has believed that compositional analysis by chromatography was the most effective manner to determine the physical properties of natural gas. With Orbital's online transducer, GasPT, this is no longer the case. GasPT provides all the physical properties required without the traditional problems, costs, processing time and complexities of gas chromatography.

Similar to a pressure or temperature transmitter, GasPT is intrinsically safe, fast, small and rugged and can be installed directly on the pipeline.

GasPT measures a number of easily monitored physical properties of a sample of gas from which it infers a composition. From the inferred composition, GasPT uses ISO6976 to calculate:

- Calorific Value (CV) / British Thermal Unit (BTU)
- Wobbe Index (WI)
- Relative Density (RD)
- Compression Factor (Z)
- Methane Number (MN)
- Total Air Requirement (TAR)

GasPT benefits:

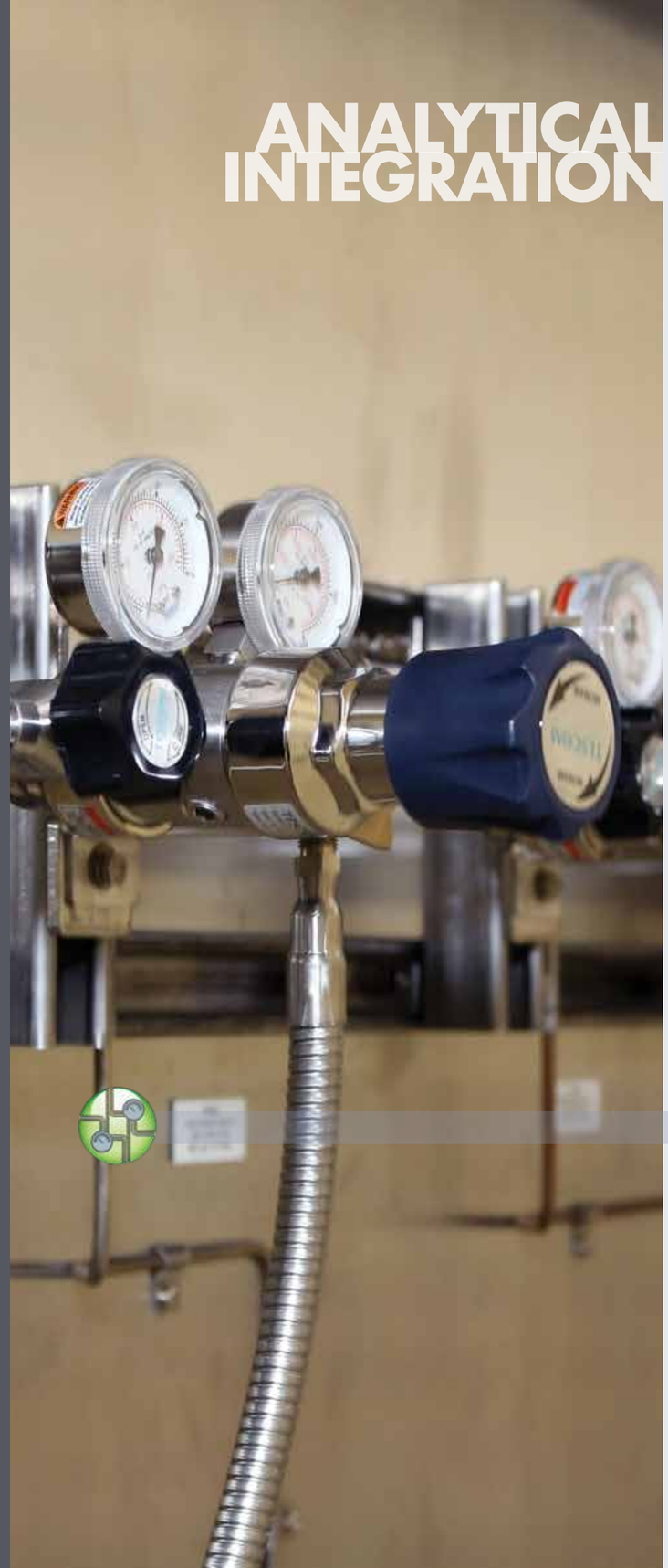
- 2-8 second analysis time for all properties
- No utility gas required (e.g. carrier gas)
- High accuracy
- No calibration required
- Virtually no maintenance required
- No configuration or set-up required ('Plug & Play')
- Low initial and installation cost
- Low operational cost

Devices used by Orbital:

- Chromatography
- Electrolytical devices
- Infra-red devices
- TDLs
- Ultrasonic devices
- GasPT

Suppliers of analyzers we can offer:

- Yokagawa
- Siemens
- ABB
- Emerson
- SICK
- Endress & Hauser
- Azbil
- Others



ANALYTICAL INTEGRATION

Orbital's project management

All projects undertaken by Orbital are subject to a stringent project management system. This means that all possible routes to engineering, designing and delivering the solution have been explored, ensuring that the best results are always achieved. Orbital endeavors to work to strict scheduling, meaning that projects are delivered on time, consistently. From small-scale to multi-million dollar projects, Orbital has the expertise and bandwidth to successfully manage any size project.

Orbital's employees

Orbital has more than 100 years worth of industry experience under its belt, comprising analytical system integration and analytical application knowledge. Orbital's workforce is made up of a carefully selected team, working within a number of different departments:

- Project Management
- Project Engineering
- Design Engineering/CAD
- Purchasing
- Accounting
- Fabrication
- Testing
- Sales

Expertise

- Petrochemical
- Metal manufacture and processing
- Chemical/Specialty Chemical
- Refining
- CEMS/Environmental
- LNG
- Fracking Processes
- Natural Gas Distribution/Custody Transfer/Process Control
- Pharmaceutical
- Utilities/Liquid Sources

Services

Orbital offers a range of services, encompassing full professional support:

- Front-End Engineering Design
- Analytical Systems Integration
- Startup, Commissioning & Field Services
- Field Installation Services
- Training
- Crating/Packaging

ANALYTICAL INTEGRATION

Solutions provider

Orbital offers a wide selection of analytical systems for a diverse range of applications. Orbital is committed to providing unmatched turnkey solutions that are customizable to suit your needs. We tailor our solutions to your specific application, ensuring that the best results are always delivered.

Any analyzer brand can be readily integrated into our solutions, making them highly versatile and therefore suitable for an extensive range of applications.

Sample system engineers

Orbital's complete sample systems have been developed and refined over its 30+years experience in the gas industry. Orbital provides tailored solutions for trace measurement, natural gas, LNG, oil and chemical sampling applications, among many others.

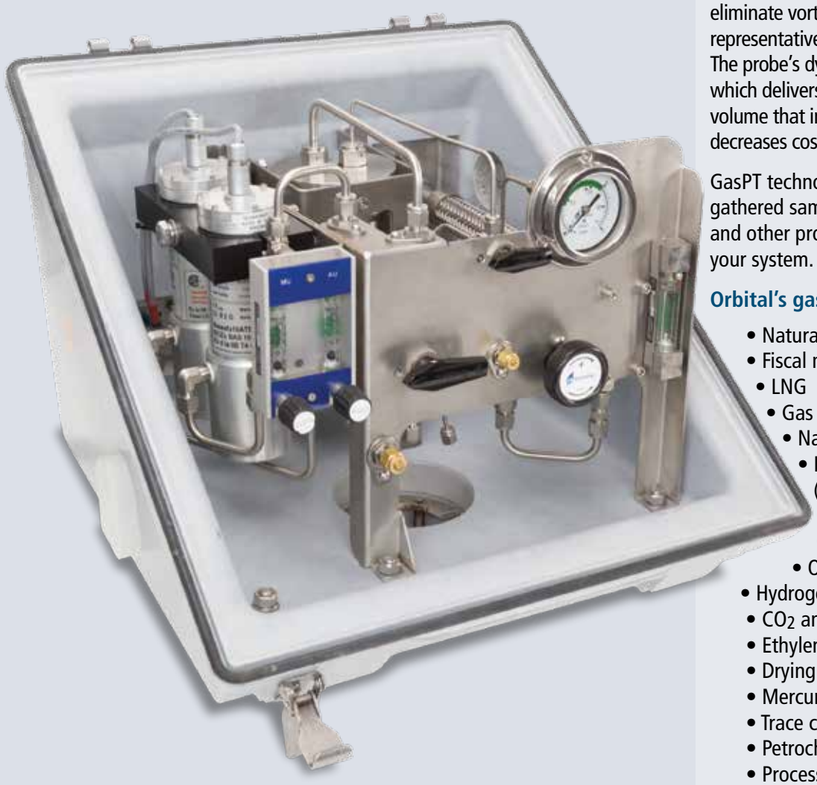
Orbital utilizes its superior VE Technology® sample probes and sample conditioning systems to achieve the best results possible, ensuring sample integrity is always maintained from sample point to return point.

Product developers

Orbital is the innovator of GasPT® and VE Technology. GasPT is a fast-response, highly accurate, "plug-in-and-play" natural gas physical properties transmitter. VE Technology comprises a selection of expertly designed sampling and monitoring solutions, including the patented helical strake VE Technology probes and thermowells, which are able to completely eliminate vortex induced vibration, a common cause of failure in conventional probes.

Orbital's supervisory and control applications:

- Hazardous area
- Small process monitoring systems
- Automation
- Complex PLC and HMI systems
- Data acquisition
- Data logging systems
- Metering and flow computer applications
- Analytical control and supervisory systems
- DCS / SCADA applications
- RTU



VE Technology

VE Technology® is exclusively licensed to Orbital from EnDet Ltd.

GasPTi - INTEGRATING SAMPLING AND ANALYSIS FOR REAL TIME, CONTINUOUS RESULTS

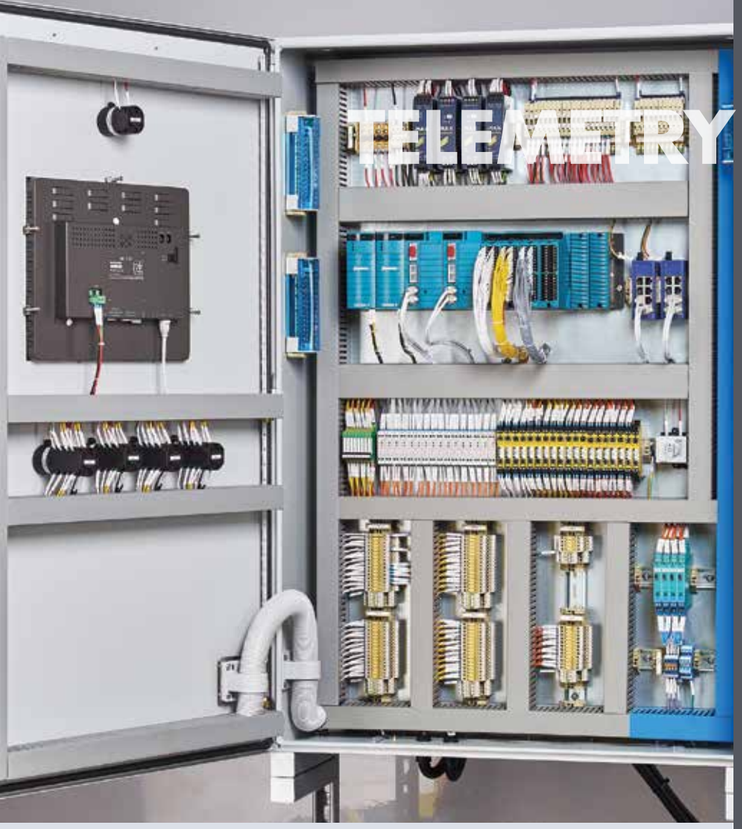
Combining two patented gas technologies - GasPT® and VE Technology® - Orbital's integrated GasPTi solution provides gas sampling and analysis through continuous measurement, requiring no carrier or calibration gases or maintenance.

Orbital's VE Technology uses specialized probes that eliminate vortex shedding to take smaller, more representative samples that reach the analyzer faster. The probe's dynamic filtration removes contamination which delivers a cleaner sample which allows reduced volume that improves response, enhances accuracy, decreases costs and reduces waste.

GasPT technology measures and analyzes the VE gathered samples giving you the Calorific Value (BTU) and other properties of the gas needed to control your system.

Orbital's gas analysis applications:

- Natural gas quality
- Fiscal metering
- LNG
- Gas properties/composition
- Natural gas hydrocarbon dew point
- Liquid analysis (e.g. LPG and liquid propane)
- Sulphur, H_2S, Mercaptan analysis
- Moisture analysis
- Oxygen analysis
- Hydrogen analysis
- CO_2 analysis
- Ethylene manufacture
- Drying process enhancement
- Mercury measurement
- Trace contaminant measurement
- Petrochemical applications
- Process and monitoring applications
- Safety applications



TELEMETRY

IRIS-RTU - EMPOWERING YOU WITH CRITICAL DATA

Orbital's IRIS is a remote telemetry unit (RTU) that empowers the user with data. The IRIS system, once utilized, provides control, monitoring and detailed information relating to each physical device linked to it.

IRIS comprises two main elements:

- **Hardware:** The IRIS rack is fully dual redundant and has a PLC control system with various modules sized to the required I/O of the site/process, for both safe and hazardous areas – connecting the real world to IRIS' virtual world. A number of hardware solutions can be provided on which to host the IRIS-RTU software depending upon budget and/or the functionality required.

- **Software:** The IRIS software is unique, in that it is non-licensed, web-based software for interrogation and communication to the IRIS hardware.

IRIS is specifically designed to offer improvement in efficiency, reduce operating costs, enhance stability, heighten security and most importantly, improve the interface between sites, control rooms and operatives at all levels and locations.

Key features:

- Easy to use app driven software
- License-free web based software
- Redundant hardware and operating system
- Low maintenance
- Faulty operating parts can be hot swapped with zero set up
- Extensive diagnostic tools
- Large storage capacity of data for equipment connected to IRIS and of the site/process (e.g. manuals, data sheets, drawings can be accessed via IRIS)
- Highly secure
- Secure log in with user permissions
- Users can access any of their IRIS systems remotely and globally via the web

Where to use IRIS?

Oil & gas pipelines:

- Monitor and control flow, pressure, gas properties
- Perform emergency shutdowns, monitor remote exploration and storage sites

Water and wastewater:

- Improve distribution system or collection system operations
- Optimize treatment plants, water treatment (chemical and energy savings), and landfill sites

Electric power distribution:

- Controlling load break switchgear, and IEDs (intelligent electronic devi**ces) at substations or pad**

Communication network monitoring and control:

- Remote monitoring of critical equipment such as power systems, environmental control systems, tower lights, etc.

RENEWABLE GAS SOLUTIONS

BIOMETHANE REGENERATING SUSTAINABLE GAS

Orbital's BioMethane systems comply with all the required network entry standards, such as the UK's Ofgem and GS(M)R 1996. Within Orbital's BioMethane systems, we offer any of the following features:

- Energy measurement
- Gas Quality measurements
- Fiscal Metering system
- Pressure control including slam-shut valve
- Interface control rack / flow computation rack
- Gas odorization system
- BioMethane recirculation facility
- Reject gas pressure control
- Orbital liquid propane injection system

Orbital, who continues to lead the market in technology and quality to producers across the globe, provides a full BioMethane solution from gas analysis to data configuration, export to RTU system and finally communication with your system.

In addition to our work in the BioMethane market, Orbital has been involved with gas measurement, fiscal metering and gas odorization for many years, all of which are vital activities to allow BioMethane to enter a natural gas network.