

# HYDROCARBON PROCESSING



## GAS ANALYSIS MAGAZINE

ISSUE  
TWO - 2017

SUPPORTING YOUR HYDROCARBON  
PROCESSING APPLICATIONS

### MARKET SOLUTIONS

Marine vapor recovery systems

### APPLICATION STUDY

Gas analysis for combustion in HP plants

### EXPERT ADVICE

Servomex's systems integration solution



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# GET TO KNOW OUR HP TEAM:

HUI YU GUAN

Servomex's dedicated, experienced hydrocarbon processing (HP) team provides the expertise and applications knowledge to ensure the best gas analysis solutions for you.

With an extensive global installed base, our analyzers and systems are used in midstream and downstream applications, providing the accurate, reliable gas analysis that forms a vital part of all HP processes.

One of the key members of Servomex's HP team is Hui Yu Guan, who became HP Marketing Manager for China in 2016.

Her role is to drive business growth in China by developing the HP strategy for the region and implementing it in co-operation with the sales team.



Having worked for Servomex for 14 years, Hui Yu has an expert knowledge of our product range, as well as the requirements of customers in the Asia Pacific (ASPAC) region.

This allows her to quickly identify the right solutions for new projects, and supply the right support for existing systems.

Hui Yu joined Servomex's ASPAC team in 2003 as Sales Support Engineer, and was promoted to Sales Support Leader for ASPAC two years later to assist the sales team with pre-sales for the region.

In 2007, Hui Yu was promoted to the role of ASPAC Operations Manager, a position she held until her promotion to Marketing Manager last year.

As Operations Manager, she was responsible for setting up local support for the Singapore and China offices, improving the efficiency of the inquiry/order process for pre-sales in the ASPAC region.

The role also involved engineering responsibility for design and project management of sample conditioning systems. Hui Yu also improved quality control to ensure ISO 9001 compliance.

Hui Yu is a graduate of Shanghai Dianji University, where she studied Electrical Engineering and Automation Technology.



For HP solutions in China, email [hguan@servomex.com](mailto:hguan@servomex.com)

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Get peace of mind for your plant with expert visits under our service contracts.



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This magazine is published by Servomex Group Limited, Crowborough, East Sussex, TN6 3FB. Editorial enquiries and feedback should be sent to Colin Jones, Marketing Communications Director. Email: [cjones@servomex.com](mailto:cjones@servomex.com)

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# SEE THE FULL PICTURE ONLINE

## SEE INSIDE SERVOMEX

Get an insight into our world-class manufacturing facilities where sensors and SERVOTOUGH & SERVOFLEX analyzers are built



## SERVOMEX OxyDetect

Our non-depleting Paramagnetic oxygen monitor available for safe and hazardous areas – see the benefits



## SERVOTOUGH Laser 3 Plus

See the advantages of Servomex's latest product range as we introduce three new compact TDL analyzers



## SERVOFLEX Portables

Four gas analyzers in 60 seconds – see why we've made gas analysis easy to handle in this product range movie



Watch at [servomex.com/videos](http://servomex.com/videos)

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FOR THE FULL RANGE OF ANALYZERS VISIT [servomex.com/gas-analyzers](http://servomex.com/gas-analyzers)

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# MARKET FOCUS: NORTH AMERICA

## MARKET BACK ON TRACK FOR 2018

The shale gas boom has turned the US into the world's largest gas producer, and shows no signs of slowing down.

In a report published in July, the International Energy Agency predicted that the US would generate almost 40% of the increase in global gas output between 2016 and 2022. By 2022, this will leave the US producing more than a fifth of the world's natural gas.

While much of this output is likely to go to exports, the effect this boom has had on lowering prices has led to an expansion in the petrochemical industry globally.

Energy prices across the world have stabilized, which in turn has brought fresh confidence to the HP market. Project schedules are getting back on track, with both upgrades and new-build projects

### ETHYLENE BOOM FOR MANUFACTURERS

A large part of the US chemical industry is based on ethylene as an intermediate, and the US is the biggest ethylene supplier in the world.

Ethylene is produced by cracking ethane and higher hydrocarbon components of natural gas liquids. The intermediate propylene is also produced, though in lesser quantities.

Ethane cracker plants produce the raw materials needed for plastics and chemical manufacturing, and their proximity to shale gas deposits keeps their production costs low. This has seen a big increase in ethane production, in turn creating an excellent supply of ethylene for manufacturers.

Many companies in Europe and Asia use naphtha, which is derived from crude oil and is more expensive. So, a consistent supply of the cheaper intermediate gives US manufacturers a clear advantage.

going ahead after being delayed while prices fluctuated.

The US and Middle East regions are likely to be most active in accelerating their projects, but this growth will happen worldwide.

The expected expansion of the market in 2018 will open up a number of opportunities for gas analysis companies. Servomex's expertise in combustion and ethylene production applications will provide an advantage in these areas.

Servomex customers can also benefit from the company's position as a total solution provider, providing all the analysis requirements for new plants or upgrades.

Ethylene and propylene are used to make important industrial products such as polyethylene, PVC, EO, PO/TBA, and polypropylene, and so the shale boom makes conditions highly favorable for US companies using these substances.

Servomex is well placed to take advantage of these, offering these solutions for every part of the ethylene production process.

# MARKET SOLUTIONS

## SERVOMEX SUPPLIES MARINE VAPOR RECOVERY SYSTEMS

Servomex has provided fixed and portable gas analysis solutions to the marine industry for more than 30 years.

Typically, this involves systems for marine terminals and tanker vessels involved in the transfer and transportation of crude oil and refined products.

As tanks are filled, large volumes of vapor are generated, which must be either vented or 'recovered'. During these activities, gas monitoring is important to ensure the safety of the vessel, terminal, and personnel, and also to reduce harmful emissions.

Strict regulations are in place controlling the systems used to monitor marine vapors. In the US, for example, the Coast Guard enforces rules about analyzer performance and suitability to the hazardous environment.

The vapors produced during loading are either returned to the plant and used as fuel or raw materials, or taken to a safe area and incinerated. In both cases, it is important to monitor the return lines for air ingress, otherwise explosive conditions may occur.

This requires two Paramagnetic oxygen analyzers, as regulations insist on redundancy within each system. Servomex's solution is either the SERVOTOUGH Oxy 1900 or SERVOTOUGH OxyExact 2200, which are both certified for use in hazardous areas.

The non-depleting technology ensures greater reliability, as there is no question mark over how long the sensor will last before needing replacement.

To control emissions during vapor recovery or destruction, the SERVOTOUGH

SpectraExact 2500 Infrared analyzer is used to monitor hydrocarbons, while the multi-gas SERVOPRO 4900 monitors combustion by-products such as CO and SO<sub>2</sub>.

System designs have become well-developed and the technology is long-proven, so the performance and cost of ownership benefits of Servomex's solutions mean it has become the go-to supplier for marine vapor recovery systems.

With its analyzers approved by the US Coast Guard, Lloyd's Register and other regulatory bodies around the world, it has supplied more than 100 systems to the USA, and many more globally.

This strong track record, along with Servomex's global service network, has placed the company at the forefront of marine vapor recovery gas analysis.

*"The reliability and proven performance of Servomex systems in the marine industry, and our excellent field support, have helped us build good customer relationships and a strong reputation as a turnkey solutions provider."*

Kent Merrill - Servomex Regional Sales Manager. Email: kmerril@servomex.com



### KEY GAS ANALYSIS SOLUTIONS FOR ETHYLENE PRODUCTION

#### SERVOTOUGH SpectraScan 2400



A real-time, tunable filter Infrared analyzer ideal for measuring light hydrocarbons.

#### SERVOTOUGH SpectraExact 2500



A robust multi-gas analyzer designed for demanding process applications.

#### SERVOTOUGH FluegasExact 2700



A high-performance analyzer for oxygen and combustibles, designed for use in challenging locations.

#### SERVOTOUGH Laser 3 Plus



A compact TDL gas analyzer range optimized for combustion, ammonia slip or process control applications.

Contact our Texas business center to discover our complete solutions for gas analysis in hydrocarbon processing applications.

+1 281 295 5800 or email [americas\\_sales@servomex.com](mailto:americas_sales@servomex.com)



### SERVOMEX SOLUTIONS FOR MARINE VAPOR RECOVERY SYSTEMS

#### SERVOTOUGH Oxy 1900



Safety-enhanced oxygen analysis for hazardous or challenging applications.

#### SERVOTOUGH OxyExact 2200



Process oxygen analyzer, designed for ultimate monitoring performance.

#### SERVOTOUGH SpectraExact 2500

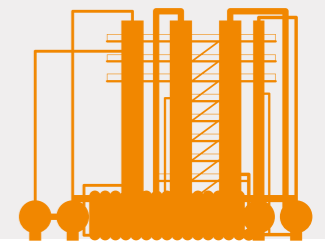


Multi-gas analyzer designed for demanding process applications.

#### SERVOPRO 4900



For multi-gas measurements of flue gases, pollutants and reference oxygen.



### SERVOMEX COMBUSTION ANALYSIS SOLUTIONS

For O<sub>2</sub> analysis, Tunable Diode Laser (TDL) analyzers offer an average path measurement across all burners, while Zirconia analyzers measure a single point. TDL is susceptible to a range of environmental factors that must be compensated for, including path length variation, window purge gas effects, optical interferences and changes in temperature and pressure.

The oxygen measurements are relatively comparable; however, the measurement of the carbon monoxide with TDL showed a marked improvement in performance with a faster speed of response, ideal for both efficiency and – more importantly – safety, albeit at the cost of having a second analyzer.

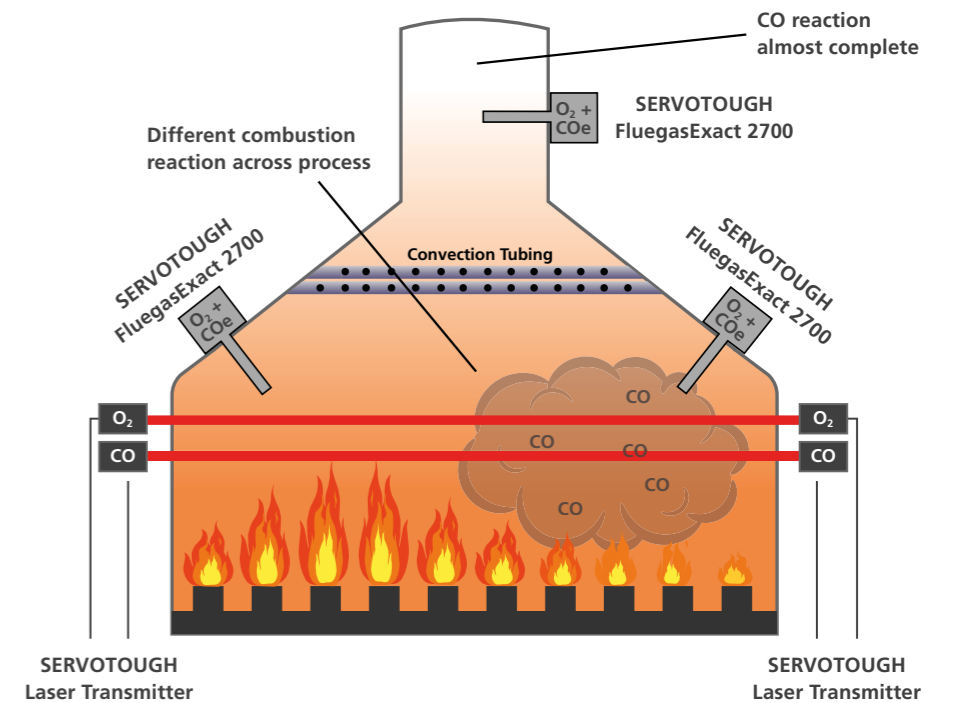
TDL measurements can also be built into flame-out protection, specifically the measurement of methane (CH<sub>4</sub>) in natural gas burners. If a TDL analyzer is installed so that a burner flame-out can be detected quickly, it enables greater flexibility and response to control and shut down processes.

TDL lasers come complete with SIL (Safety Integrity Level) certification and so can be incorporated into safety systems in a relatively straightforward manner.

Zirconia and TDL analyzers offer great advantages when considered as complementary techniques for combustion control. It is not unusual to see a

combination of Zirconia analyzers measuring O<sub>2</sub> (for efficiency) and TDL measuring CO (for safety), giving the best of both worlds.

### SERVOMEX COMBUSTION MEASUREMENTS IN THE PROCESS HEATER



## CONTROLLING COMBUSTION IN FIRED PROCESS HEATERS

Fired process heaters are integral to hydrocarbon processing. Specifically designed for the reaction of fuel and air to produce extremely high gas temperatures, heaters transfer this energy to potentially highly flammable process fluids via heat exchangers.

They consume large quantities of fuel, produce large quantities of emissions, and are a potential safety hazard to personnel and plant. However, they are currently irreplaceable within many petrochemical processes – so they warrant the highest levels of understanding and care in their operation and control.

The cornerstone of a well-controlled combustion process is an optimized air-to-fuel ratio for efficient fuel consumption. This produces considerable benefits, in the form of efficiency, reduced emissions, safety, and extended life of equipment.

Before analyzer technologies were developed to measure excess air in the products of combustion, fired heaters were run in conditions of high excess air. Although this meant inefficient and costly fuel consumption, it was the only way to avoid the creation of low-oxygen, fuel-rich conditions that could lead to a potentially dangerous explosion.

Too much oxygen leads to cooler burning, causing a significant reduction in combustion efficiency due to an increased loss of heat to the atmosphere, while the excess of oxygen available combines with nitrogen and sulfur to produce undesirable emissions.

The understanding that a fuel-rich (high carbon monoxide) situation is a potential source of explosions has caused the measurement of carbon monoxide to move from a supporting combustion measurement to a key safety measurement.

### SERVOMEX ZIRCONIA AND TDL ANALYZERS



The SERVOTOUGH FluegasExact 2700 provides ultra-accurate and reliable measurements of oxygen using Zirconia technology. Its extractive sampling design makes it ideal for use in extreme heated environments such as process heaters.

[servomex.com/fluegasexact2700](http://servomex.com/fluegasexact2700)



For TDL measurements, the SERVOTOUGH Laser 3 Plus Combustion is recommended for both O<sub>2</sub> and CO measurements. Its compact size makes installation easy, while it provides a fast response, cross-stack measurement. This CO analyzer can also be optimized to measure CH<sub>4</sub> as an additional safety measurement for flame-out protection.

[servomex.com/laser3pluscombustion](http://servomex.com/laser3pluscombustion)



# A GLOBAL APPROACH TO SYSTEMS SOLUTIONS

Servomex's world-leading expertise in manufacturing gas analysis solutions has developed over many years to encompass the delivery, build and maintenance of complete systems packages, ranging from simple utility panels to fully-contained shelters.

We have a global capacity for building gas analysis systems, with state-of-the-art engineering centers in the Americas, Asia Pacific, Europe and India.

Designed to order, these systems are built to last by our expert engineers. Our custom approach means we can meet all

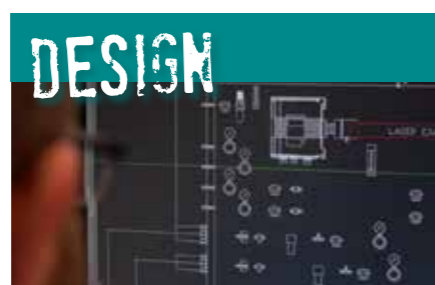
the requirements of our customers, while ensuring each system is optimized for performance, reliability and safety.

Our core systems offer is summed up by our three-step approach – we consult, design and deliver.



## CONSULT

We meet with you and agree management procedures to ensure your requirements are met at every stage. Our experts will propose the best solutions and map out a timescale for the project.



## DESIGN

The next step sees our world-leading team design a system that meets your agreed specifications. We'll manage your project to reach the optimum solution for your process, meeting all necessary safety regulations.



## DELIVER

Our specialists will build your system within the agreed timeframe. We'll oversee the installation and commissioning of the system, ensuring it is fully optimized for your process. We'll also provide complete support.

Once tested and verified, our systems are dispatched to customers across the globe, providing optimized performance, extended system lifetime, ultimate process efficiency and a reduced cost of ownership.

## SERVOMEX OxyDetect – AN ESSENTIAL ADDITION FOR LIFE SAFETY IN SYSTEMS SHELTERS

Servomex's OxyDetect life safety oxygen monitor is an essential addition to field analyzer shelters housing large systems. Available for both safe and hazardous areas, the OxyDetect accurately monitors oxygen levels without being affected by the sensor deterioration seen in traditional electrochemical sensors.

SIL 2 compliant, the OxyDetect is particularly recommended for all Middle East-based systems, because of the effects of dry and hot climates on

electrochemical sensors which can produce frequent false positives and a reduced lifespan under these conditions.



- Non-depleting Paramagnetic design delivers a long-life sensor
- Exceptional measurement stability means no false positives which cost time and money to resolve
- Advanced microprocessor-based diagnostics are safe, reliable and easy to access via digital front-panel interface



Watch the video at [servomex.com/oxydetect](http://servomex.com/oxydetect)

## SYSTEMS AVAILABLE TO SUIT EVERY SIZE AND NEED:



### UTILITIES:

Simple utilities panels for analysis systems, including flow meters and pressure regulators that link to our analyzer range.



### PANELS:

Sampling systems on open panels, for easy accessibility to components for calibration and maintenance.

Ideal for:

- Process control
- Marine vapor recovery



### RACKS:

Systems integrating rack-mounted analyzers for SERVOPRO and DF ranges.

Ideal for:

- CEMS
- Multi-gas monitoring

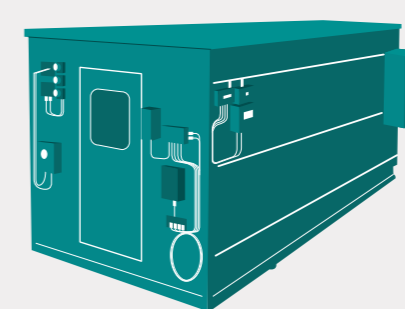


### ENCLOSURES:

Enclosures to ensure suitable weather protection for your system. Suitable for hazardous areas.

Ideal for:

- Safety monitoring
- Inerting



### HOUSES:

Fully-contained air conditioned shelters for large systems projects, customized for individual process requirements.

Ideal for:

- PTA production
- Oxidation control
- Centrifuge safety
- Recycle monitoring



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Get the right systems solution for your process with Servomex. Visit: [servomex.com/systems](http://servomex.com/systems)



## UPGRADE YOUR 1900 TO THE OXY

The reliable, accurate and advanced SERVOTOUGH Oxy analyzer has set the standard for oxygen gas analysis, even in the most challenging applications.

It was created as an upgrade for the 1900, which was launched in 1996 and is still in widespread use today.

Although the legacy 1900 has been a reliable analyzer for applications such as process control, safety-critical oxidation, flare stack analysis and vapor recovery, there are strong benefits in upgrading to the Oxy.

While both rely on Servomex's trusted Paramagnetic oxygen sensor, the 1900 is an analog device, while the Oxy is a modern, microprocessor-based analyzer.

Thanks to its software, the Oxy has the ability to self-diagnose faults and issues.

And, because the Oxy either matches or exceeds the 1900 in every department, there's no need to compromise on performance.

Both analyzers are heated, but the Oxy is heated more efficiently to 60°C (140°F), giving it much greater measurement stability.

Unlike its predecessor, the Oxy offers auto-validation and auto-calibration, and is SIL 2 compliant, ensuring it provides solid reliability in hazardous areas.

The improved temperature coefficient of the Oxy makes it ideal for parts of the world with highly variable weather conditions and extreme temperature swings, such as the Middle East and Asia.

Further options for the Oxy include an innovative heated sample bulkhead, which was not offered by the legacy 1900. This removes the need for a sample conditioning system on samples with a dew point of up to 50°C (122°F).

It also provides peace of mind if sample systems fail – the cause of around 80% of all Paramagnetic replacements – as it maintains the process fluid in its gas phase, minimizing any damage to the analyzer from sample condensation.

The Oxy's microprocessor-based flow alarm option is a great improvement upon the 1900's flow switch, while a barometric/vent pressure compensation system enables tighter process control than in the 1900.

*"The Oxy is a good 10 years newer than the 1900, which is a long time in technology terms. Because of this, the Oxy offers much improved standard features and strong, value-adding options."*



Matt Halsey  
Product Manager  
Process Oxygen,  
Zirconia & Oxygen Deficiency.  
Email: mhalsey@servomex.com

	1900	Oxy
Technology	Paramagnetic	Paramagnetic
Auto-validation	N	Y
Auto-calibration	N	Y
Self-diagnosis software	N	Y
Analog output	One 4-20mA, one 0-1V DC	One 4-20mA
Digital communications	N	RS485 or Modbus TCP
SIL 2 compliance	N	Y
Linearity	<0.05% O <sub>2</sub>	No measurable effect
Repeatability	<0.05% O <sub>2</sub>	0.02% O <sub>2</sub>
Ambient temp coefficient	0.2% O <sub>2</sub> per 10°C	<0.03% O <sub>2</sub> per 10°C
Vent pressure effects	1% O <sub>2</sub> per 1% change in pressure	<0.05% O <sub>2</sub> per 1% change in pressure
Heated sample bulkhead	N	Y
Pressure compensation	N	Y
Intelligent flow sensor	N	Y

### THE OXY OFFERS:

- GREATER REPEATABILITY
- FASTER RESPONSE TIMES
- SAME TRUSTED ACCURACY, LINEARITY AND DRIFT
- SIGNIFICANTLY BETTER TEMPERATURE COEFFICIENT



## GASIFICATION PROCESS

A SET OF CHEMICAL REACTIONS THAT USE LIMITED OXYGEN TO CONVERT FEEDSTOCKS CONTAINING CARBON INTO A SYNTHETIC GAS, KNOWN AS SYNGAS.

Gasification has been used commercially for more than 60 years in the refining, fertilizer and chemical industries, and more than 35 years in the electric power industry.

Coal-fired power plants center around a boiler, with coal burned by combustion to convert water into steam.

However, the heart of any plant incorporating gasification is a cylindrical pressure vessel called a gasifier.

Feedstocks enter the gasifier at the top, while steam and oxygen enter from below.

The feedstock can be any carbon-containing material – including coal, petroleum coke, biomass or waste – which makes gasification a highly flexible process.

Coal gasification, of course, uses coal for the process. Gasifiers operate at higher temperatures and pressures than coal boilers, which means the coal undergoes different chemical reactions.

Partial oxidation of the coal's carbon releases heat which helps feed the gasification reactions. Pyrolysis occurs as the volatile matter within the coal degrades into several gases, leaving behind a charcoal-like substance known as char.

Following this, reduction reactions transform the remaining carbon in the char into the gaseous mixture known as syngas.

The two main components of syngas are carbon monoxide (CO) and hydrogen (H<sub>2</sub>). Raw syngas is run through a gas clean-up process where it passes through a cooling chamber to separate the various components.

This clean-up can remove harmful impurities from the syngas, such as sulfur, mercury and unconverted carbon. Carbon dioxide (CO<sub>2</sub>) can also be pulled out of the gas and stored underground, or used in ammonia or methanol production.

The remaining pure syngas, which is comprised solely of hydrogen and carbon monoxide, can be combusted cleanly in gas turbines to produce electricity.

Alternatively, some power plants convert the syngas to natural gas by passing the cleaned gas over a nickel catalyst. This causes CO and CO<sub>2</sub> to react with the free hydrogen to create methane, which can be used to generate electricity or heat buildings.

Syngas can also be further processed to manufacture chemicals, fertilizers, liquid fuels, or hydrogen.

### SERVOMEX'S GAS ANALYSIS SOLUTION FOR GASIFICATION PROCESS

#### SERVOTOUGH OxyExact 2200

OXYGEN SOLUTION



A high-specification oxygen analyzer optimized for demanding process monitoring applications. The OxyExact 2200 is used to measure oxygen at the taphole extraction point, usually in a voting system. It combines precise Paramagnetic oxygen sensing technology with a rugged, safety-enhanced design.

[servomex.com/oxyexact2200](http://servomex.com/oxyexact2200)

#### SERVOTOUGH SpectraExact 2500

CARBON MONOXIDE



A robust Photometric multi-gas analyzer designed to provide flexible analytical solutions to many applications. The SpectraExact 2500 is used to monitor CO in the feed hopper, where a level of 0-1% is required. It delivers real-time online measurements in the harshest process conditions.

[servomex.com/spectraexact2500](http://servomex.com/spectraexact2500)

#### SERVOTOUGH Laser 3 Plus Ammonia

AMMONIA SOLUTION

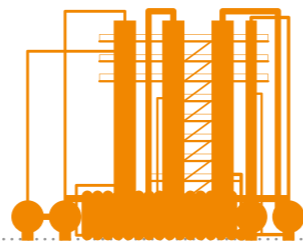


A compact Tunable Diode Laser analyzer for in-situ cross-stack applications. The Laser 3 Plus Ammonia is used to monitor ammonia on the scrubber vent line. It uses the latest Wavelength Modulated Spectroscopy (WMS) techniques to provide a fast, stable response to measuring ammonia.

[servomex.com/laser3plusammonia](http://servomex.com/laser3plusammonia)

Upgrade to the Oxy today! Find out more at [servomex.com/oxy](http://servomex.com/oxy)

# PROCESS STUDY



SERVOMEX SUPPLIES GAS ANALYSIS SYSTEMS FOR PROCESS AND QUALITY CONTROL TO MANY GASIFICATION CUSTOMERS ACROSS THE WORLD. THE MAIN ANALYZERS USED IN THESE SYSTEMS ARE:

- SERVOTOUGH SpectraExact 2500 on the feed hopper to measure 0-1% CO
- Redundant SERVOTOUGH Oxy 1900 and OxyExact 2200 SIL 2 analyzers on the taphole extraction line
- SERVOTOUGH Laser 3 Plus Ammonia on the scrubber vent line

Author: David Fahle - Market Sector Manager, Hydrocarbon Processing. Email: dfahle@servomex.com

## THE PROCESSES OF GASIFICATION IN DETAIL

Gasification itself can be broken down into separate elements, which all take place within the gasifier and relate to temperature levels within the overall process.

### DRYING (100-150°C)

Water within the feedstock is driven off with heat, by vaporization.

### PYROLYSIS (200-500°C)

This is the application of heat to the dried feedstock, in the absence of air. It breaks down the feedstock into char (a charcoal-like substance), tar gases and liquids.

### COMBUSTION (800-1200°C)

This can be fueled by either the tar gases or char from pyrolysis. All of the heat for drying, pyrolysis and reduction (depending on the gasifier type) comes from combustion, or is recovered indirectly by heat exchange processes.

### CRACKING (800-1200°C)

The heat breaks down large complex molecules such as tar into lighter gases. This process is crucial in producing a clean gas.

### REDUCTION (650-900°C)

Reduction is the reverse process of combustion. It strips oxygen atoms from hydrocarbon molecules to return the molecules to a combustible form. It usually operates in equilibrium with the combustion process, and is responsible for transforming the carbon from the char into syngas.

## 1 GASIFICATION REACTIONS

The feedstock reacts with oxygen to form hydrogen and carbon monoxide. Keeping the temperature high ensures complete conversion of all feedstock materials.

## 2 BY-PRODUCT USAGE

Inorganic materials from the coal are trapped in a glassy matrix resembling coarse sand. This inert material is referred to as slag, and has various uses in the construction industry. There is no ash waste from the gasification process.

## 3 PARTICULATE REMOVAL

A scrubbing system removes all particulates from the gas.

## 4 GAS ENHANCEMENT

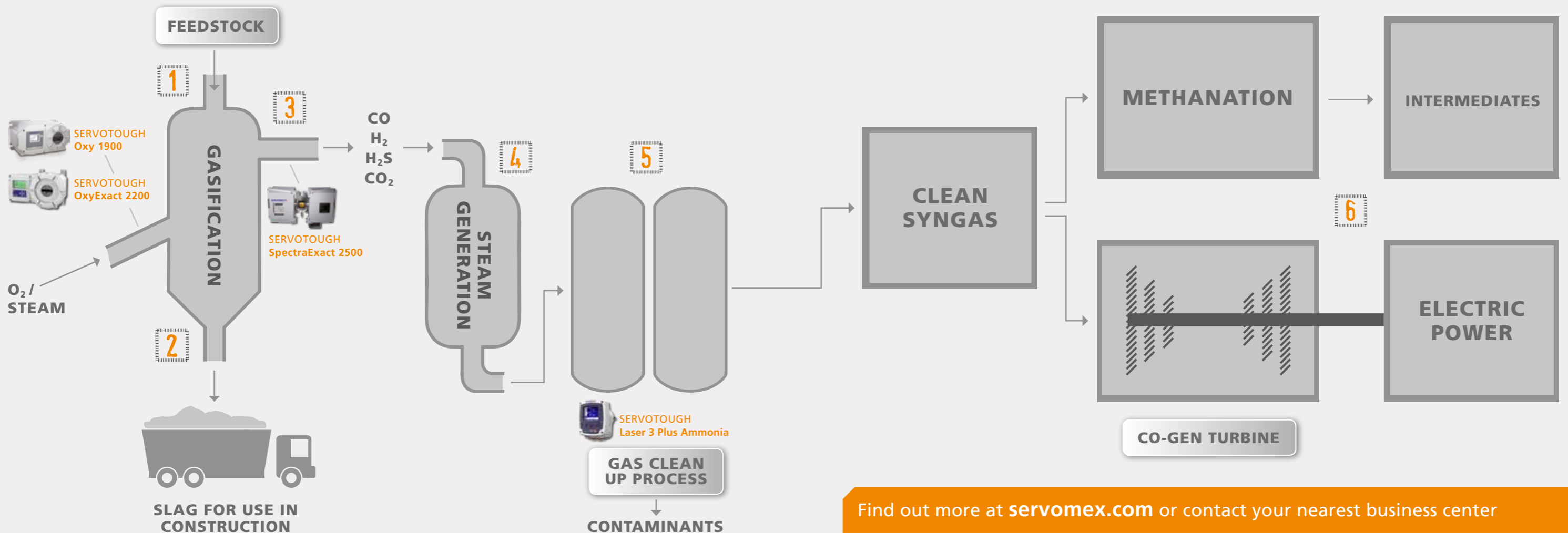
As the sour syngas is cooled, steam is injected into the gas stream. Then, a catalytic reaction enhances the oxygen content of the syngas.

## 5 SYNGAS CLEAN-UP

In a series of gas clean-up process steps, chloride, mercury, sulfur contaminants and carbon dioxide are removed from the syngas stream.

## 6 SYNGAS USAGE

The clean, hydrogen-rich syngas can be used in a combustion turbine to generate electrical power, or can undergo methanation to be converted to useful manufacturing intermediates.



Find out more at [servomex.com](http://servomex.com) or contact your nearest business center

## PEACE OF MIND FOR YOUR PROCESS ANALYZER SYSTEMS

A Servomex Service Network Contract doesn't just bring our expertise to your door. It also provides peace of mind.

Regular maintenance of your gas analysis systems adds value to your operations with improved reliability, increased uptime and process optimization of plant applications.

The Servomex Service Network offers a wide range of maintenance packages customized to meet your unique needs, ranging from off-site telephone support to the complete management and maintenance of your gas analysis systems.

Whether you choose from one of our ready-made packages or create a custom package that precisely fits your plant's requirements, every Service Network Contract offers guaranteed service levels with numerous benefits.

**EXAMPLE:**  
Servomex support in practice

**CUSTOMER:**  
A large petrochemical facility operated by a global chemical company.

**REQUIREMENTS:**  
Technical assistance with all the Servomex analyzers used at the plant, providing:

- Validation and calibration
- Hardware and software maintenance
- Training
- Sharing 'best practice' maintenance and operation

**WHAT WE DO:**  
One of our skilled technicians attends the firm's plant for two days each quarter.

**RESULTS:**  
The company secures the use of a qualified analyzer technician, allowing them to fill in any skills gaps. They can prepare a 'to do' list for the service operative's visit, as well as schedule certain maintenance functions and training.

**PRODUCTS COVERED BY THE CONTRACT:**

- 18 SERVOTOUGH OxyExact 2200s
- 22 SERVOTOUGH SpectraExact 2500s
- 28 SERVOTOUGH FluegasExact 2700s
- 3 SERVOTOUGH LaserSP 2900s

**OUTCOME:**  
The contract has proved very successful and has been extended for a further year.



*"Essentially, we become another set of skilled hands to help with the plant analyzer maintenance – the client loved it."*



David Fahle - Market Sector Manager, Hydrocarbon Processing. Email: dfahle@servomex.com

<p><b>SERVICE CONTRACTS</b></p>	<p>COMMISSIONING</p>	<p>ON-SITE SERVICE SUPPORT</p>	<p>HEALTH CHECK</p>	<p>SPARES</p>
	<p>SERVICE CENTER SUPPORT</p>	<p>RENTAL EQUIPMENT</p>	<p>TRAINING</p>	<p>CALIBRATION KITS</p>

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## > HP PRODUCT GUIDE

Hydrocarbon processing (HP) is one of the most demanding industries in the world. High levels of productivity must be achieved while constantly maintaining the very highest safety standards.

Effective gas analysis is a critical component of all HP processes, typically requiring a wide range of measurements to ensure the safe, optimized running of the process.

As the world leader in gas analysis, Servomex analyzers and systems are used extensively in midstream and downstream HP processes covering refining and the production of chemicals, petrochemicals, natural gas and fuels.

These rugged, resilient analyzers are custom designed to perform in the most extreme process conditions; our expertise, combined with a detailed applications knowledge, ensures the best gas analysis solution is delivered to your plant.

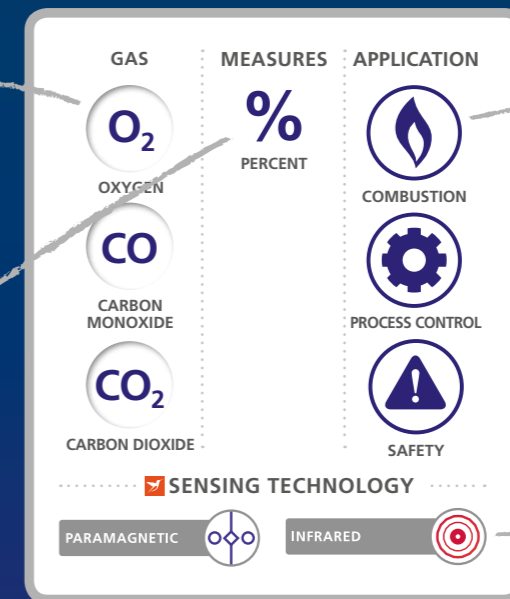
Supported by a global network of service and support, Servomex analyzers are chosen with confidence by HP operators worldwide in the knowledge that they guarantee operational safety, product quality and process efficiency.

## FIND YOUR PRODUCT NOW

## > HOW TO GUIDE

*Some analyzers are optimized for single gas measurements while others monitor multiple gas types.*

*We offer all measurement ranges from percentage to ultra trace parts per trillion analysis.*



*We identify which application types the analyzer is suitable for operating in.*

*The Hummingbird sensing technologies used are listed.*

For the full range of Servomex analyzers, visit [servomex.com/gas-analyzers](http://servomex.com/gas-analyzers)



## SERVOTOUGH

Built to meet the extreme challenges of measuring gases in hot and hazardous environments, the SERVOTOUGH process and combustion analyzers integrate Servomex's exceptional analytical performance into a highly robust and resilient design.

Optimized for hazardous area use, and utilizing both extractive and in-situ analysis techniques, common gas measurements receive higher level analysis for light hydrocarbons and combustibles; this makes SERVOTOUGH analyzers ideal for extensive use within most hydrocarbon processing applications.

Manufactured to the highest specifications using custom-designed stainless steel enclosures, SERVOTOUGH analyzers are intrinsically safe and certified to the uppermost safety standards.

## SUPPORTING



PROCESS CONTROL



PROCESS SAFETY



EMISSIONS MONITORING



COMBUSTION CONTROL



PRODUCT QUALITY

## SERVOTOUGH OxyExact 2200

HAZARDOUS AREA



### HIGH SPEC PROCESS O<sub>2</sub> ANALYZER OFFERS SAFE OR HAZARDOUS AREA CONTROL WITH UP TO SIX TRANSMITTERS

The OxyExact 2200 high specification O<sub>2</sub> analyzer offers an unrivaled combination of precision, flexibility and performance for optimum process and safety control. The OxyExact can be configured with a safe or hazardous area control unit with up to six transmitters.

- Zone 1 certified to ATEX Cat 2, IECEx and FM/CSA Class 1 Div 1
- Three enclosure systems allow sampling of any flammable gas up to 100% O<sub>2</sub> and pressures of up to 40psi
- High temperature version eliminates the need to condense hot sample prior to analysis

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	PROCESS CONTROL SAFETY

SENSING TECHNOLOGY



## SERVOTOUGH Oxy 1800

SAFE AREA



### ACCURATE AND STABLE SAFE AREA O<sub>2</sub> ANALYZER

Designed to reliably measure percent O<sub>2</sub> in many safety critical industrial applications, the Oxy 1800 is a stable, accurate and highly specific O<sub>2</sub> analyzer for safe area use.

- Internal/external use (IP66/NEMA 4X rated)
- Special version for solvent bearing samples
- Range of alarm outputs aids integration with other systems

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	PROCESS CONTROL SAFETY

SENSING TECHNOLOGY



## SERVOTOUGH SpectraScan 2400

HAZARDOUS AREA



### REVOLUTIONARY INLINE REAL-TIME ANALYSIS OF HYDROCARBON COMPONENTS C1-C6

A real time optical analyzer utilizing the Precise field proven optical bench, the SpectraScan 2400 delivers a breakthrough capability in the continuous analysis of light hydrocarbons C1-C6.

- North American Cat 1, Div 2 ATEX Cat 3 IECEx Zone 2
- Tunable band-pass filter enables simultaneous scanning of selected wavelength bands for gases including methane, ethane, propane and iso-Butane
- Unique tunable filter process with IR photometer technology delivers industry-leading interference compensation

GAS	MEASURES	APPLICATION
CO CARBON MONOXIDE	% PERCENT	PROCESS CONTROL
CO <sub>2</sub> CARBON DIOXIDE	CV CALORIFIC VALUE	QUALITY
C1-C6		
H <sub>2</sub> S HYDROGEN SULFIDE		

SENSING TECHNOLOGY



## SERVOTOUGH Oxy 1900

HAZARDOUS AREA



### AWARD-WINNING PARAMAGNETIC DIGITAL O<sub>2</sub> ANALYZER DESIGNED FOR HAZARDOUS AREA USE

Offering an exceptional range of industry-standard options and three unique, ground-breaking functions, the Oxy 1900 O<sub>2</sub> gas analyzer sets new standards of flexibility, stability and reliability from a single, cost-effective unit.

- Can be used in Safe Area to Zone 1/Div 1 hazard rated locations
- Heated sample cell allowing simplified sample system requirements
- Unique Servomex Flowcube flow sensor technology for improved safety

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	PROCESS CONTROL SAFETY

SENSING TECHNOLOGY



## SERVOTOUGH SpectraExact 2500

HAZARDOUS AREA



### RUGGED PHOTOMETRIC GAS ANALYZER FOR DEMANDING PROCESS APPLICATIONS

Servomex's iconic industry-leading photometric analyzer delivers flexible single and multi-component gas analysis capability for corrosive, toxic and flammable sample streams. The SpectraExact 2500's reliable, accurate and stable real-time online process analysis makes it ideal for a range of process, combustion and emissions gas analysis applications.

- ATEX, IECEx and North American hazardous area approvals
- Easy integration with DCS – from 4-20mA to Modbus TCP
- Sample cell and electronics segregated – for easy maintenance and safe operation

GAS	MEASURES	APPLICATION
TOXIC	% PERCENT	PROCESS CONTROL
FLAMMABLE	ppm TRACE	
CORROSIVE		

SENSING TECHNOLOGY



# SERVOTOUGH FluegasExact 2700

HAZARDOUS AREA



## ADVANCED FLUE GAS ANALYZER FOR HIGH-TEMPERATURE MEASUREMENT OF O<sub>2</sub> AND COMBUSTIBLES

Designed to measure O<sub>2</sub> and CO<sub>e</sub> in flue gases for improved combustion efficiency and reduced emissions, the FluegasExact 2700 gas analyzer is designed to suit the most demanding needs of combustion efficiency applications in the Power Generation and Process Industries.

- ATEX Cat. 3, IECEx Zone 2 & North America Class I, Div 2
- Unique Flowcube flow sensor technology enables positive flow conditions to be validated
- Sulfur-resistant combustibles sensor enables sensor to operate at elevated sulfur levels

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	COMBUSTION
CO <sub>e</sub> COMBUSTIBLES	ppm TRACE	PROCESS CONTROL

**SENSING TECHNOLOGY**

CALORIMETRY ZIRCONIA

# SERVOTOUGH LaserSP 2930

HAZARDOUS AREA



## HIGH-SENSITIVITY CROSS-STACK TDL ANALYZER

A high performance gas analyzer designed for continuous in-situ monitoring, the LaserSP 2930 delivers a fast response time and highly stable performance. Suitable for measuring a range of gases including HCl, HF, H<sub>2</sub>O, H<sub>2</sub>S, HCN, and other hydrocarbons, the LaserSP is ideal for a wide range of process, combustion control and emissions applications.

- Designed for Zone 1 and Zone 2 hazard rated (gas/dust) locations
- In-situ with no sample conditioning delivers reliable operation
- Wavelength Modulated Spectroscopy provides wide dynamic range and lowest cross interference

GAS	MEASURES	APPLICATION
MULTIPLE	% PERCENT	PROCESS CONTROL
	ppm TRACE	EMISSIONS

**SENSING TECHNOLOGY**

TUNABLE DIODE LASER

# SERVOTOUGH Laser 3 Plus Process

HAZARDOUS AREA



## THE WORLD'S SMALLEST TDL GAS ANALYZER, OPTIMIZED FOR PROCESS O<sub>2</sub> AND CO MEASUREMENTS

All the benefits of Servomex's TDL technology in a small, light unit offering unparalleled installation flexibility plus cost and performance benefits. Optimized for the fast, accurate and responsive measurement of process oxygen in hot or hazardous conditions.

- High safety integrity utilizing Servomex's own line lock cuvette technology
- ATEX, IECEx and North American hazardous area approvals. Approved for process Zone 2. SIL 2 assessed and CE marked
- Quick and easy installation by one person with on-board display negating the need for laptop configuration
- Suitable for a range of combustion and process control applications

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	PROCESS CONTROL
CO CARBON MONOXIDE	ppm TRACE	COMBUSTION

**SENSING TECHNOLOGY**

TUNABLE DIODE LASER

# SERVOTOUGH LaserCompact 2940

HAZARDOUS AREA



## SHORT PATH LENGTH TDL ANALYZER

Optimized for measurement across pipes and along short measurement cells and able to measure through very thin nozzles, reducing or even eliminating consumption of purge gas, the LaserCompact 2940 delivers the fast response time, highly stable performance and minimum sample conditioning advantages of TDL technology.

- ATEX, IECEx and North American hazardous area approvals. ATEX Cat 3 (Gases) and Cat 2 (Dusts) IECEx Zone 2 and Zone 21. CSA Divisions and Zones (Gas and Dust)
- Line width correction delivers accurate measurement with variations in matrix
- In-situ with low purge gas consumption

GAS	MEASURES	APPLICATION
MULTIPLE	% PERCENT	PROCESS CONTROL
	ppm TRACE	QUALITY

**SENSING TECHNOLOGY**

TUNABLE DIODE LASER

# SERVOTOUGH Laser 3 Plus Combustion

HAZARDOUS AREA



## THE REVOLUTIONARY COMPACT COMBUSTION ANALYZER OPTIMIZED FOR CO, O<sub>2</sub>, OR CO + CH<sub>4</sub> MEASUREMENTS

Containing all the benefits of Servomex's TDL technology in a light, compact unit, with unmatched installation flexibility plus cost and performance benefits, this analyzer is optimized for fast, accurate and responsive measurements in combustion and process control, making it a must for safety applications.

- High safety integrity utilizing Servomex's own line lock cuvette technology
- Compact size means quick and easy installation by one person with on-board display negating the need for laptop configuration
- ATEX, IECEx and North American hazardous area approvals. Approved for process Zone 2. SIL 2 assessed and CE marked
- Optimized for combustion processes

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	PROCESS CONTROL
CO CARBON MONOXIDE	ppm TRACE	COMBUSTION
CO+CH <sub>4</sub> CARBON MONOXIDE + METHANE	ppm TRACE	COMBUSTION

**SENSING TECHNOLOGY**

TUNABLE DIODE LASER

# SERVOTOUGH LaserExact 2950

HAZARDOUS AREA



## EXTRACTIVE TDL TRACE MULTI-GAS ANALYZER, DESIGNED FOR MEASURING TRACE GASES OFFLINE

Specifically designed for extractive trace analysis applications, the LaserExact 2950's TDL technology offers unsurpassed low ppb detection limits for most gases, making it ideal for the measurement of trace gases offline.

- Zone 2/Div 2 hazard rated locations and use without purge
- Advanced multipass cell delivers ppb or low ppm detection limits
- Innovative PeakLock pattern recognition line tracking eliminates drift over extended operational periods

GAS	MEASURES	APPLICATION
MULTIPLE	ppb ULTRA TRACE	PROCESS CONTROL
	ppm TRACE	QUALITY

**SENSING TECHNOLOGY**

TUNABLE DIODE LASER

# SERVOTOUGH DF-340E

## HAZARDOUS AREA



### HIGH SENSITIVITY TRACE/ PERCENT COULOMETRIC OXYGEN ANALYZER CERTIFIED FOR HAZARDOUS AREA USE

Designed for heated or external locations, the DF-340E remains stable in changing sample and flow rate conditions, and is designed to provide measurements of trace or percent level oxygen in pure gas streams and multi-gas backgrounds. It is ideal for upset prone conditions.

- Coulometric sensing ideal for upset prone applications and compensates for sample and flow rate fluctuations
- Suitable for outdoor installation, with NEMA 4-rated sensor enclosure options
- Multiple background gas stream monitoring, with simplified ongoing maintenance requirements

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	ppb ULTRA TRACE ppm TRACE	PROCESS CONTROL QUALITY

#### SENSING TECHNOLOGY



# H2Scan

## HAZARDOUS AREA



### EXPLOSION-PROOF IN-LINE HYDROGEN PROCESS ANALYZER, USING A SOLID-STATE, NON- CONSUMABLE SENSOR CONFIGURED TO OPERATE IN PROCESS GAS STREAMS

The H2Scan hydrogen process analyzer features thin film technology that provides a direct hydrogen measurement that is not cross-sensitive to other gases.

- UL Class 1, Div 1, Groups B, C, D. ATEX & CSA certifications
- Easily configurable alongside SERVOTOUGH SpectraScan 2400
- Simple system integration

GAS	MEASURES	APPLICATION
H <sub>2</sub> HYDROGEN	% PERCENT	PROCESS CONTROL QUALITY

#### SENSING TECHNOLOGY

H2Scan thin film

# SERVOPRO

## SUPPORTING

The SERVOPRO range makes Servomex's reliable, stable and accurate gas measurements available to a diverse range of safe area applications.

An extensive range of non-depleting Servomex gas sensing technologies - including Paramagnetic, Zirconium Oxide, Thermal Conductivity, Plasma and Gas Chromatography - are integrated into flexible analyzers that either meet specific measurement requirements, such as for syngas, hydrocarbons or trace gas mixtures, or provide multi-gas monitoring capabilities for applications including ASU production and continuous emissions monitoring (CEMS).

Designed for benchtop use, or mounting in a 19" rack, all SERVOPRO analyzers feature extensive functionality, remote communication options and can be operated directly via intuitive onboard software.



PROCESS CONTROL



PROCESS SAFETY



EMISSIONS MONITORING



COMBUSTION CONTROL



PRODUCT QUALITY

# AquaXact 1688

## SAFE AREA



### A FAST, ACCURATE AND RESILIENT MOISTURE MEASUREMENT SOLUTION

The AquaXact 1688 is a rugged ultra-thin film aluminum oxide moisture sensor that enables the measurement of moisture in a wide variety of gas phase process applications, such as glove boxes, air separation units, natural gas processing, transportation, and instrument air, with no calibration required after sensor replacement or dry-out.

- Functions as a standalone 4-20 mA transmitter or remotely interfaces with SERVOPRO MonoExact DF310E multichannel gas analyzer system
- High-performance field-replaceable sensor element unaffected by condensation and liquid water
- Stainless steel, weatherproof casing (which is Class 1 Div 2) enables operation in ambient temperatures ranging from -10°C to +70°C

GAS	MEASURES	APPLICATION
H <sub>2</sub> O WATER	DEW POINT ppmv	PROCESS CONTROL

#### SENSING TECHNOLOGY



# GAS DETECTION OxyDetect

## SERVOMEX



### NON-DEPLETING PARAMAGNETIC OXYGEN MONITOR DESIGNED FOR LIFE SAFETY APPLICATIONS

Life safety monitor designed for safe area or hazardous area environments, utilizing superior performance of non-depleting Hummingbird Paramagnetic O<sub>2</sub> sensing technology.

- IP66 (indoor use only)
- The most reliable O<sub>2</sub> detector on the market
- No more false readings or false alarms caused by depleting cell technologies
- SIL 2 approval

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	SAFETY

#### SENSING TECHNOLOGY



# SERVOPRO 4900

## SAFE AREA



### CONTINUOUS EMISSIONS MONITORING (CEMS) ANALYSIS OF MULTIPLE FLUE GAS COMPONENTS

The SERVOPRO 4900 is specifically designed for Continuous Emissions Monitoring, where legislation requires the measurement of several gas components in flue gas. The 4900 offers multi-gas capability for pollutants, greenhouse gases and reference O<sub>2</sub>, including CO, CO<sub>2</sub>, NO, SO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O.

- MCERTS/TÜV approved measurements
- Low maintenance and cost of ownership
- Easy integration with other systems

GAS	MEASURES	APPLICATION
MULTIPLE	% PERCENT ppm TRACE	EMISSIONS

#### SENSING TECHNOLOGY



## SERVOPRO NOx

SAFE AREA



### CHEMILUMINESCENCE DETECTOR (CLD) ANALYZER FOR KEY EMISSIONS APPLICATIONS INVOLVING ULTRA-LOW NO, NO<sub>2</sub> AND NOx

Utilizing Chemiluminescence detection technology to measure NO or NO/NO<sub>2</sub>/NOx concentrations in industrial gas and vehicle emission applications, the versatile SERVOPRO NOx can be calibrated for four measurement ranges starting from ultra-low to high ppm and is easy to install and operate.

- Multiple range NOx emissions monitoring solution with a fast response
- Non-depleting light-based measurement and electronic flow control keeps costs low
- Heated version available for wet to dry conversion option

GAS	MEASURES	APPLICATION
NO NITRIC OXIDE	ppm TRACE	PROCESS CONTROL
NO <sub>2</sub> NITROGEN DIOXIDE		EMISSIONS
NOx NITROGEN OXIDES		QUALITY

**SENSING TECHNOLOGY**  
CHEMILUMINESCENCE

## SERVOPRO SO<sub>2</sub>

SAFE AREA



### USES PROVEN PULSED UV FLUORESCENCE TECHNOLOGY TO DELIVER A PRECISE AND RELIABLE MEASUREMENT OF ULTRA-LOW SULFUR DIOXIDE IN EMISSIONS AND AMBIENT AIR

For industrial applications that require ultra-low emissions monitoring of sulfur dioxide, this robust analyzer is designed to slot seamlessly into rack systems, making it easy to integrate with existing emissions monitoring systems to provide unrivaled performance.

- Ultra-long-lasting UV light source
- Removable flash memory stores up to 10 years of data
- Operation over wide temperature range reduces cost of ownership

GAS	MEASURES	APPLICATION
SO <sub>2</sub> SULFUR DIOXIDE	ppm TRACE ppb ULTRA TRACE	PROCESS CONTROL
		EMISSIONS QUALITY

**SENSING TECHNOLOGY**  
UV FLUORESCENCE

## SERVOPRO HFID

SAFE AREA



### HIGH-PERFORMANCE FAST ANALYSIS OF TOTAL HYDROCARBONS, METHANE AND NON-METHANE HYDROCARBONS

Using a highly sensitive Flame Ionization Detector (FID) for measuring volatile hydrocarbon concentrations in industrial or vehicle emission applications, the HFID utilizes an internally heated oven set to 190°C to maintain the sample gas above its dew point, for optimum performance in total hydrocarbon analysis (THC).

- Four user-definable measurement ranges, reconfigurable in the field
- High-accuracy, gas-selective FID technology for maximized uptime
- Heated oven for maximum stability and "hot/wet" sampling

GAS	MEASURES	APPLICATION
THC TOTAL HYDROCARBONS	ppm TRACE	PROCESS CONTROL
CH <sub>4</sub> METHANE		EMISSIONS
NMHC NON-METHANE HYDROCARBONS		QUALITY

**SENSING TECHNOLOGY**  
FLAME IONIZATION DETECTOR

## SERVOFLEX

## SUPPORTING

With the precision sensing technology of Servomex fixed analyzers in a compact, easy to use package, SERVOFLEX analyzers deliver high performance portable gas analysis for safe or hazardous area use.

Utilizing Servomex's non-depleting Paramagnetic and Infrared sensor technology, SERVOFLEX analyzers provide stable and reliable measurements for oxygen, carbon monoxide and carbon dioxide.

Ergonomically designed for easy handling, and powered by resilient lithium-ion batteries to ensure long usage with every charge, each analyzer offers an extensive range of features that includes audible alarms, data-logging and RS232 outputs.

Certified to a range of relevant safety requirements, Servomex's SERVOFLEX analyzers make the grade wherever they are used.

PROCESS CONTROL	PROCESS SAFETY	EMISSIONS MONITORING
COMBUSTION CONTROL	PRODUCT QUALITY	

## SERVOFLEX Micro i.s. 5100

PORTABLES



### INTRINSICALLY SAFE ANALYZER MEASURES OXYGEN, CARBON MONOXIDE OR CARBON DIOXIDE

Designed for the measurement of toxic and flammable gas samples, the intrinsically safe Micro i.s. 5100 is a unique analyzer certified to Zone 0 and Zone 1 and suitable for measuring percent levels of O<sub>2</sub>, CO and CO<sub>2</sub>.

- Intrinsically safe design to ATEX and IEC standards ensures safety operation in hazardous environments
- Ergonomic design ensures easy operation on the move
- Available in non-pump or pump versions with optional sample conditioning kit

GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	COMBUSTION
CO CARBON MONOXIDE		PROCESS CONTROL
CO <sub>2</sub> CARBON DIOXIDE		SAFETY

**SENSING TECHNOLOGY**  
PARAMAGNETIC INFRARED

## SERVOFLEX MiniHD 5200

PORTABLES



### PORTABLE GAS ANALYZER FOR MEASUREMENT OF COMMON GAS MIXTURES

Designed for use in field locations or light industrial applications, the MiniHD 5200 portable gas analyzer is a rugged, heavy duty analyzer designed to accurately measure the levels of O<sub>2</sub>, CO and CO<sub>2</sub> within common gas mixtures. The MiniHD 5200 utilizes Servomex's non-depleting Paramagnetic and Infrared sensors to give dependable and accurate results.

- Robust IP65 construction meets the demanding needs of field location analysis
- Long life Li-ion rechargeable batteries and range of sampling options ensure ease of use
- Accurate measurement of O<sub>2</sub>, CO and CO<sub>2</sub> levels with no background interference

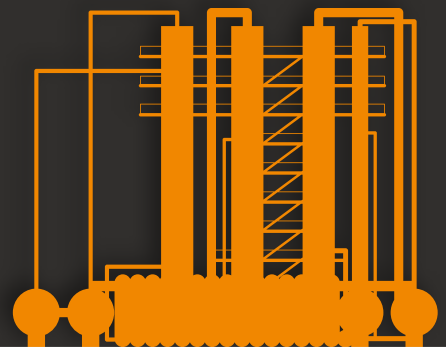
GAS	MEASURES	APPLICATION
O <sub>2</sub> OXYGEN	% PERCENT	COMBUSTION
CO CARBON MONOXIDE		PROCESS CONTROL
CO <sub>2</sub> CARBON DIOXIDE		SAFETY

**SENSING TECHNOLOGY**  
PARAMAGNETIC INFRARED

# HYDROCARBON PROCESSING

## WE'RE READY TO HELP

WHATEVER YOUR HP REQUIREMENTS, WHEREVER YOU ARE



**SERVOMEX** 

A MEASURABLE ADVANTAGE

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