

# ES

EXPERT SOLUTIONS

# INTEGRATED SYSTEMS SOLUTIONS

ISSUE:22

THE GAS ANALYSIS MAGAZINE

## THE JOURNEY OF A SYSTEM

See inside our process, from consultation to installation

## SCALABLE SOLUTIONS

Discover how our systems range from single analyzers to climate-controlled shelters

## OUR SYSTEMS SHOWCASED

See examples of gas analysis systems designed for a range of applications

BUILDING SYSTEMS THAT  
**ENSURE YOUR  
SUCCESS**

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

**SERVOMEX**   
a spectris company



*Plants are like small cities. There's more than one stakeholder, and typically more than one person involved in the decision-making. By communicating effectively with everyone, we ensure we provide the best solution – the satisfied customer is the one that always comes back to us.*

Richard Bobeck, System Engineering Manager – [rbobeck@servomex.com](mailto:rbobeck@servomex.com)

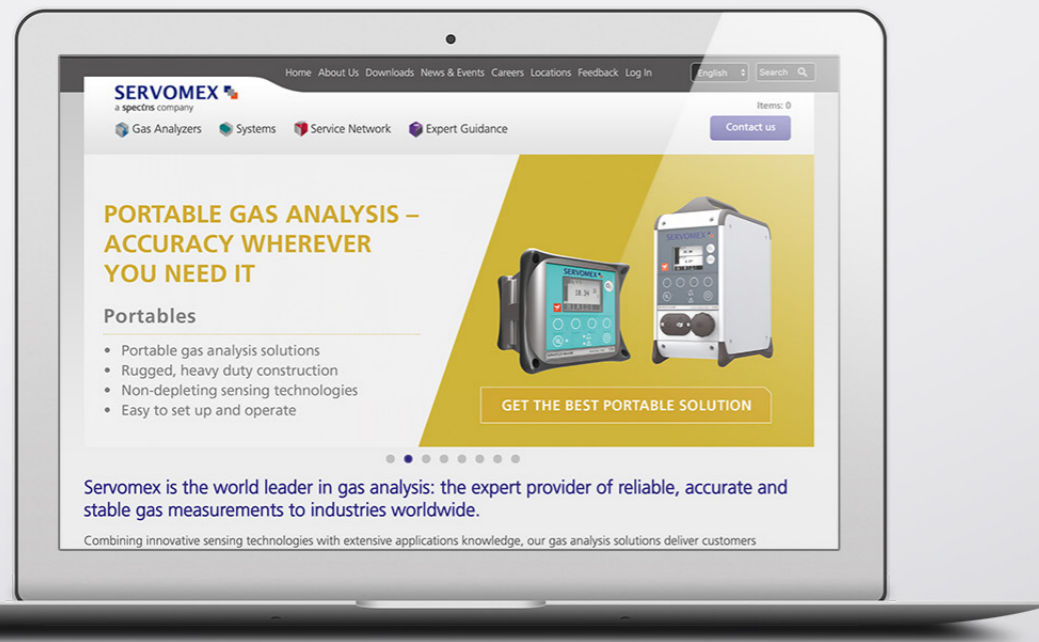
See page 08



# SERVOMEX.COM

FIND EVERYTHING YOU NEED ONLINE

- FREE DOWNLOADS
- REQUEST A QUOTE
- FIND YOUR LOCAL BUSINESS CENTER
- MAKE AN ENQUIRY



See the full picture at [servomex.com](http://servomex.com)

# OUR EXPERT TEAM, SUPPORTING YOURS

Welcome to the latest issue of Expert Solutions, focusing on the fully customizable, scalable systems designed and manufactured by Servomex engineers.

Every time we begin a systems project, our goal is to ensure 100% customer satisfaction. Our sole focus is to deliver premium gas analysis solutions, based on our extensive industry experience, high-quality products, and unparalleled applications knowledge.

From hydrocarbon processing to semiconductor gases, we have the engineering skills you need for gas analysis systems integration.

We look at every project through the eyes of the customer, ensuring that the resulting system is safe, environmentally friendly, easy to operate and maintain, and provides the data you need.

In this magazine, you'll discover the wide range of solutions we can deliver, and learn how we apply the same high levels of quality and care to every size of system, from single analyzers to air-conditioned shelters holding multiple devices.

Our decades of gas analysis expertise are built into every system we produce, for consultancy and design to project management, build, and installation.

To find out how we can support your process, get in touch at [servomex.com/contact-us](http://servomex.com/contact-us)



**SHELLEY MOORE**  
GLOBAL HEAD OF SYSTEMS  
[smoore@servomex.com](mailto:smoore@servomex.com)

This magazine is published May 2020 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)

[@servomex](https://twitter.com/servomex) [linkedin.com/company/servomex](https://www.linkedin.com/company/servomex) [www.facebook.com \(search Servomex Group\)](https://www.facebook.com/search/Servomex%20Group)

# IN THIS ISSUE

**P04-05.** Discover our global approach to transforming systems.



**P08-13.** The journey of a system from planning to installation.

**P14-15.** Examples of systems solutions for marine vapor recovery and multi-gas analysis.



**P16-17.** Global service support for our systems.

# TAKE CONTROL THROUGH TRAINING

If you're investing in a Servomex system, long-term reliability and maximum performance is critical. Whether you're an on-site user or part of the maintenance team, Servomex's training programs enhance the skills and knowledge to keep your system in optimum shape.

Delivered through classroom sessions and hands-on workshops at our state-of-the-art training centers in Europe, USA and Asia, or delivered at your site, our customized training programs will help you get optimum performance from your analyzer. Book your place today!

Enquire now: [servomex.com/training](http://servomex.com/training)

# TRANSFORMING THE WAY SYSTEMS ARE CREATED

As global experts in gas analysis systems integration, Servomex designs and delivers the most accurate, reliable solutions available, across a wide range of industries.

Each system is designed from the customer perspective. First, all the requirements are established, then we work together with the customer to find the best way to resolve their unique process challenges.

It's this collaborative approach, combined with our extensive systems expertise, that transforms the way we create and deliver systems.

Our professional, knowledgeable and experienced team has a product-focused methodology for delivering the best, most competitively priced solutions to our customers.

In addition, our gas analysis technologies offer the widest

range available to the market from a single supplier – from Paramagnetic or Infrared to Gas Chromatography or Tunable Diode Laser, with direct measurements and extractive sampling.

This means customers are not limited to one or two options – we're familiar with an extensive range of sensing technologies, so can ensure the best measurement technique is applied to each process.

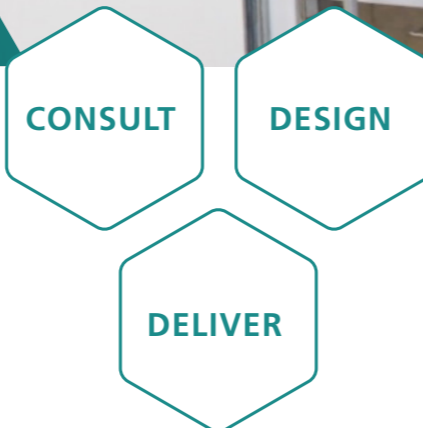
## WE SCALE OUR SYSTEMS TO EVERY REQUIREMENT:

- Single analyzer installations and simple utilities panels for analysis systems
- Sampling systems on open panels for easy accessibility
- Rack-mounted integrated analyzer systems
- Enclosures to ensure suitable weather protection
- Fully contained air-conditioned shelters for large systems projects



The Servomex team provides a global systems capability at a local level and this includes full support from our service network, which offers assistance from experts located close to your plant. Servomex's systems methodology

is built around the process of 'consult, design, deliver'. With this in mind, we are consistently able to build systems that work – reliably, accurately, and cost-effectively, with ease of use and maintenance at the forefront of our designs.



# MEET THE SYSTEMS EXPERTS

**SHELLEY MOORE**  
GLOBAL HEAD  
OF SYSTEMS

Shelley ensures every customer receives the same high standards of expertise, engineering and support from our centers.



**RICHARD BOBECK**  
SYSTEM ENGINEERING  
MANAGER

Based at our Houston Engineering Center, industry heavyweight Richard oversees our high-quality global systems builds.



**LADISLAV KUZMA**  
SYSTEM ENGINEERING  
MANAGER

Based in our UK Technical Centre in Crowborough, Ladislav oversees our systems design and integration projects in Europe and the Middle East.



**JIANFU QIAO**  
SYSTEM ENGINEERING  
MANAGER

Overseeing our systems design and integration projects in China, Jianfu is a highly experienced systems engineer based in our Asia Pacific Engineering Centre in Shanghai.



**ANKUR GOYAL**  
SYSTEM PROJECT  
MANAGER

Working from our India Systems Engineering Centre, Ankur ensures high quality system builds and support for every customer.



**FERGUS TAY**  
SYSTEM PROJECT  
MANAGER

Operating from our Singapore Business Centre, Fergus works to exceed customer expectations in the quality, delivery, and cost of systems projects in the Asia Pacific region.

*"We provide complete project management for your system from the get-go, from the initial consultation through to delivery, installation and beyond. You'll be working with the same dedicated experts across the lifetime of the project, with constant communication to ensure you get a system that's easy to use and meets all of your analytical specifications."*

Shelley Moore, Global Head of Systems – [smoore@servomex.com](mailto:smoore@servomex.com)

# A GLOBAL APPROACH WITH REGIONAL SERVICE

Our systems are built by our expert teams located in hubs around the world. State-of-the-art centers in the USA, Europe, China and India deliver accurate, reliable sensing technologies for industries including:



As a center of excellence for global systems, our Houston Systems Engineering Center is close to many hydrocarbon processing operations and customers. It sets the standards for innovation and quality and ensures that all our systems hubs provide the same level of performance for customers.

This means that wherever you are in the world, you get consistent, high-quality systems expertise that's accessible from your time zone, so you can easily communicate with our teams inside working hours, building a partnership that supports your project from start to finish.

Our regional approach also ensures your system doesn't have to travel halfway around the world to reach you, while our global network of service staff is close to your site to provide rapid support and maintenance for a lifetime of systems performance.

## WITH PROVEN EXPERIENCE ACROSS A WIDE RANGE OF INDUSTRIES, WE DELIVER SYSTEMS THAT TRANSFORM YOUR PROCESS

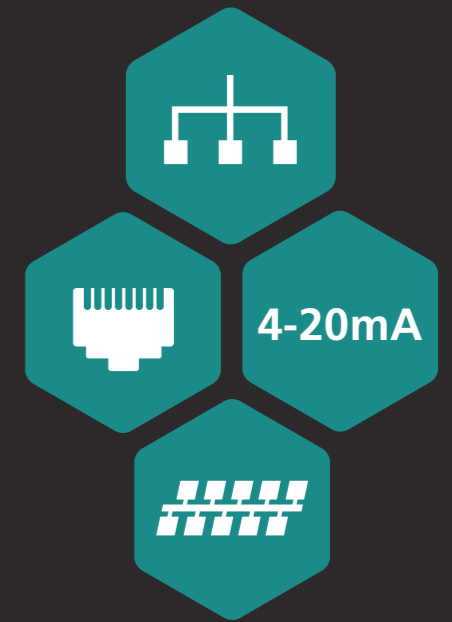
		MEASUREMENT TYPE				
		COMBUSTION	EMISSIONS	PROCESS CONTROL	QUALITY	SAFETY
IP&E	Chemicals	●	●	●	●	●
	Oil and Gas Upstream	●	●	●	●	●
	Petrochemicals	●	●	●	●	●
	Refining	●	●	●	●	●
	Power	●	●	●	●	●
P&S	Industrial Gases (N <sub>2</sub> , O <sub>2</sub> , H <sub>2</sub> , CO <sub>2</sub> )	●		●	●	●
	Semiconductor (UHP)			●	●	
	Pharmaceuticals		●	●	●	●

# INTEGRATION MADE EASY

Servomex analyzers offer a full range of digital and analog connectivity protocols – ensuring meeting current and future integration challenges.

This means easy interfacing with our systems and your own control networks, delivering numerous operational and cost benefits deployed over single and multiple sites.

Ethernet, PROFIBUS, Modbus and 4-20mA protocols are all available, allowing output and control systems to be monitored from a single point – either on-site or remotely.



Contact us to find out more: [servomex.com](http://servomex.com)

# FROM CONSULTATION TO COMMISSIONING: THE SERVOMEX SYSTEMS JOURNEY

**RICHARD BOBECK, SERVOMEX SYSTEM ENGINEERING MANAGER, WALKS US THROUGH THE SYSTEM BUILD PROCESS**



When it comes to systems, Servomex implicitly understands our customers are looking for solutions that solve problems. These could be productivity issues, cost challenges, or compliance requirements. That's why we approach the creation of a new system from a problem-solving perspective at the outset. That way we deliver the reliable, cost-effective system that ensures you meet your operational goals.

## CONSULTATION

### BUILDING THE RIGHT RELATIONSHIP

Development of a Servomex system requires genuine partnership between our systems team and our customers. To ensure we build a close relationship, we assign a dedicated team to each project. Our experts stay in place throughout that project, ensuring customers maintain consistent, accessible points of contact.

Project timescales vary significantly depending on the scope and size of the project, plant, unit, applications specifications and other requirements. For a typical small analyzers and cal/val panels, two to three months to deliver; for analyzers in enclosures, three to four months to deliver; for analyzers in a three-sided shelter, five to six months to deliver and complete analyzer shelters, seven

to ten months. We often think a systems scope clarification begins with the consultation process, but increasingly we find it starts earlier, with our team members involved during the analyzer system bidding process.

This earlier level of customer contact means that not only do clients get a clearer idea of our systems capabilities from the outset, but our experts get a greater understanding of specific customer requirements surrounding their project.

A key outcome of the consultation stage is determining parameters that need to be met by the system. The required gas measurements are our starting point, but we have many other variables to

consider: hazardous or safe area classifications, the process pressure and temperature variables, stream composition and measured components, and ambient conditions that can influence the measurements.

Other factors to consider include the number of sample points, the locations of the sample taps and the distance of the sample lines to the analyzer system. Also single or multi-phase processes and where the sampling point is located in the unit(s).

Serviceability and maintainability are critical considerations to a well thought out design and build for each analyzer system that meets the most rigorous customer expectations.

Servomex has a detailed technical questionnaire that helps the customer and our team together to focus on all the key plant, unit and application information needed to design an analyzer system. This will ensure the system meets customers specifications, environmental and safety requirements, and perform successfully.



## SAFETY FIRST, EVERY TIME

OUR SYSTEMS ARE EXPERT, RESILIENT & COMPLIANT

Hazardous areas are defined as any place where an explosive atmosphere may occur in quantities sufficient to require special precautions to protect the safety of workers. Area classification – such as an ATEX or IECEx rating – indicates the minimum design requirements for personnel safety, process operation safety, and environmental impacts.

Servomex expertise and applications knowledge ensures that the system we build meets the correct specifications for components and performance, delivering safe operation.



## DESIGN AND BUILD

### COMBINING ENGINEERING AND EXPERTISE

Once the Systems team is briefed, we confirm the most compatible gas analysis technology for the customer's application, and consider the optimum design to the optimal best solution for the customer.

For example, for analyzer systems designed for operation in the Gulf Coast region of Texas and Louisiana, our risk assessment accounts for high temperatures during the summer – and cool temperatures in the winter. Ambient temperature controls within our analyzer system

would be part of the design. Process temperatures are also a consideration to prevent unwanted condensation in the sample lines and/or a dual phase system. There are various methods used to control temperature within the analyzer systems depending on the size and scope of the project, i.e. HVAC, vortex coolers, to mention a few. These methods are typically used in enclosures and shelters.

Accessibility is critical and Servomex has different technologies and system

configurations to help plant engineers and technicians. Analyzers can be mounted in different configurations depending on the sample tap location, such as the analyzer is at the sample point, transmitter is at the sample point but the controller at grade in a convenient location, transmitter and controller is at grade on a panel, inside an enclosure or a shelter.

The application requirements and specifications are fully reviewed, then a design and bill of material are produced, typically within two to three weeks of the purchase.



All drawings and documents are reviewed by the customer until the design is agreed. A detailed bill of materials, specifying the key components of the system, is finalized following the review.

The Systems team then purchases all the required material and components, including analyzers. Around the third or fourth month of the project, this equipment should be ready for engineering to shift focus to the workshop.

Both engineering and shop integration work of the systems take place at one of Servomex's regional centers. This ensures customers are paired with a team that's easy to reach and takes into account any regional issues or challenges.

This can include meeting regional environmental legislation requirements, as well the safety and regulatory requirements.

The collaboration and communication between Servomex and the customer doesn't stop once the consultation phase is over. We continue to provide progress reports throughout the process, even while we're building it.

Typically, the build process begins with sub-assemblies such as

pressure reducing stations and associated panels. For larger systems, further assembly work on enclosures and sampling systems can be carried out ahead of the arrival of the shelter.

For larger projects such as shelters, the sub-assemblies, panels and enclosures are mounted and installed on the walls of the shelter as well as installation of the electrical system(s), gas analysis equipment and HVAC.

## DELIVERY, INSTALLATION AND SUPPORT

### FINAL STEPS FROM CHECKING TO COMMISSIONING

Following the assembly of the system, an internal system test is always performed. This is closely followed by a scheduled Factory Acceptance Test (FAT) for the complete system: a focused, collaborative process between our Systems team and the customer, often taking several days and encompasses a 100% vetting of the complete solution. After the FAT, the minor punch list items, usually tags, are cleared and an as built package is put together by document control and the project team over the next two weeks.

The finished system is then shipped to site. This is where Servomex's global Service Network gets involved, providing commissioning, personnel training and other installation support. This ensures the system is delivered to specification, on time.

Servomex's experienced, highly trained field service engineers ensure that the system is correctly installed, calibrated and performing to specifications.

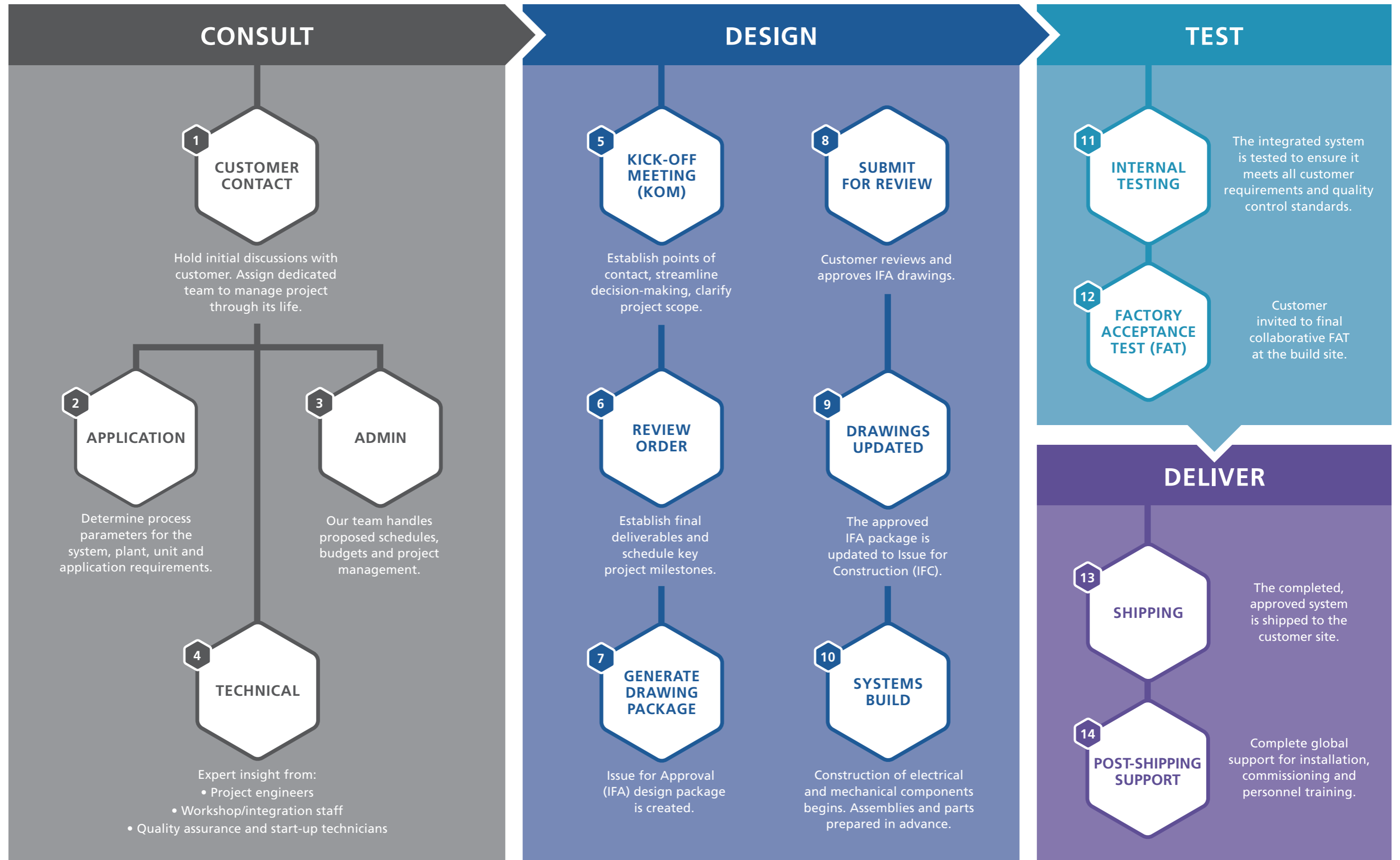
*"Creating a system is a big job, but that's what we do. The most satisfaction is to see the total solution system in the plant, with everything interconnected and working. We've taken something from initial concept, brought it into the plant, and now it's up and running, the customer is satisfied and is coming back to our team for future applications – that is the best part for us."*

Jianfu Qiao, Servomex System Engineering Manager, China.  
jqiao@servomex.com



# SYSTEMS BUILD PROCESS

FOLLOW THE SYSTEM JOURNEY, FROM INITIAL CONSULTATION TO DESIGN, TEST AND DELIVERY.



## MARINE VAPOR RECOVERY



Servomex has provided Marine Vapor Recovery (MVR) gas analysis systems solutions for more than 30 years. We also have extensive experience in supplying all the major petrochemical companies globally with similar redundant-analyzer systems for safety-critical processes. Our analyzer systems in these applications are well-developed and technology long-proven. The performance and cost-of-ownership benefits of the systems means Servomex has become the go-to supplier for all the major manufacturers of marine vapor recovery systems.

We've supplied over 100 systems to customers in the USA, and many more globally. This track record in MVR gas analysis places us as the turnkey solutions provider for Original Equipment Manufacturers.

### THE SERVOMEX SYSTEMS SOLUTION

MVR processes require the reliable, stable monitoring of % level oxygen (O<sub>2</sub>). Two Paramagnetic O<sub>2</sub> measurements are required, as regulations insist on redundancy within each system.

Our systems solution is based around either the SERVOTOUGH Oxy 1900 or SERVOTOUGH OxyExact 2200, which both use Servomex's patented Paramagnetic technology, and meet the necessary certification for use in hazardous areas. Paramagnetic sensors deliver excellent response time, and use no consumable parts, providing many years of service.

Offering a longer lifespan than depleting electrochemical

technologies, Paramagnetic cells require infrequent calibration, so deliver an overall low cost-of-ownership.

For monitoring emissions reductions, a multi-gas Infrared analyzer is typically used to monitor combustion by-products, as they function effectively in air or inert gas environments. To control emissions during vapor recovery or destruction, the SERVOTOUGH SpectraExact 2500 Infrared analyzer is used to monitor hydrocarbons, while the SERVOPRO 4900 Multigas monitors combustion by-products such as carbon monoxide and sulfur dioxide.



SERVOTOUGH Oxy 1900



SERVOTOUGH OxyExact 2200



SERVOTOUGH SpectraExact 2500

## CONTINUOUS EMISSIONS MONITORING SYSTEMS

The quality of your Continuous Emissions Monitoring System (CEMS) is essential for the safety and efficiency of many industrial processes.

Not only does it ensure compliance with environmental rules, it closely monitors emissions to quickly identify process issues and upsets, which helps to reduce operating costs.

Servomex's expert systems team is highly experienced in the design and build of CEMS, ensuring all major legislation requirements are met.

We also optimize operating costs through fast, responsive emissions monitoring measurements.

Enhanced by our expert system building capabilities, our fully integrated solutions encompass emissions analysis, data logging and reporting. They also meet hazardous area requirements and support RATA testing.

Servomex systems can also be configured to provide a range of secondary CEMS measurements as required, including temperature, flow, pressure and dust/opacity.

Servomex CEMS projects comply with all major emissions legislation, including:

- 40 CFR (Protection of the Environment) parts 60 and 75 (USA)
- Large combustion plant and waste incineration directives (UK/Europe)
- MCERTS (UK)
- TUV (Germany)
- EPA compliance (USA)

### VERSATILE MULTI-GAS ANALYSIS

Offering four simultaneous measurements for a wide range of common emissions gases, the SERVOPRO 4900 Multigas is integrated into the heart of our CEMS builds.

An advanced digital sensing platform, it was specifically developed to measure criterion pollutants, greenhouse gases,

and reference oxygen, meeting MCERT/QAL1 certification and providing a complete CEMS solution for flue gas analysis.

It offers a wide range of Servomex digital sensor measurements, including Paramagnetic, Infrared, and Gas Filter Correlation technologies. A compact, robust device, the 4900 Multigas requires

minimal cabinet space and so can be easily integrated into other systems, helping to reduce installation costs.

It also has low operational requirements, with ultra-stable performance and auto-calibration capabilities, making it an affordable solution for CEMS.



SERVOPRO 4900 Multigas



# WHATEVER YOUR SYSTEM NEEDS SERVOMEX HAS THE SOLUTION

## Analyzers and panels

**EXPERT GAS ANALYSIS INSTRUMENTATION, AND SAMPLING SYSTEMS FOR EASY ACCESS TO COMPONENTS FOR HASSLE-FREE CALIBRATION AND MAINTENANCE.**

Our wide range of sensing technologies provides diverse, easy to use solutions for many industrial applications.

### FEATURES AND BENEFITS

- Optimized sampling and wiring for easy operation
- Keeps instrumentation in safe areas for maintenance
- Tailor-made to suit your application needs
- Fully integrated Servomex gas analysis technology



## Racks

**SYSTEMS INTEGRATING RACK-MOUNTED ANALYZERS FROM OUR SERVOPRO AND DF RANGES.**

Our rack systems locate multiple gas analyzers into a single cabinet for easy control of an array of gas analysis solutions.

### FEATURES AND BENEFITS

- Multiple analyzers working seamlessly and reliably
- Intelligent software for continuous monitoring
- Designed to meet stringent safety requirements
- A scalable solution, available as fixed racks or mobile carts



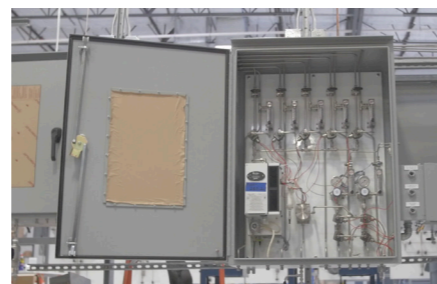
## Enclosures

**ENCLOSURES ENSURE SUITABLE WEATHER PROTECTION FOR YOUR SYSTEM. DESIGNED FOR HAZARDOUS AREAS.**

Rugged enclosed cabinets keep the instrumentation under controlled conditions for reliable, continuous performance, while allowing easy access for maintenance.

### FEATURES AND BENEFITS

- A complete system, designed into a protective cabinet
- Tailor-made to operate reliably in your process conditions
- Robust, high-quality materials
- Fully assembled, tested and certified



## Houses

**FULLY-CONTAINED AIR CONDITIONED SHELTERS FOR LARGE SYSTEMS PROJECTS, CUSTOMIZED FOR INDIVIDUAL PROCESS REQUIREMENTS.**

With their own lighting and power supply, these shelters provide reliable protection for gas analysis equipment and plant technicians.

### FEATURES AND BENEFITS

- Suitable for interior or exterior installation
- Supplied with air conditioning, power distribution, lighting and customized engineering inputs and outputs
- Maximum protection against weather conditions and hazardous process environments
- Custom-designed to accommodate any number of analyzers, equipment and other utilities



# SERVOMEX SPARES

SUPPORTING CRITICAL INDUSTRY SECTORS  
THROUGHOUT THE GLOBAL PANDEMIC

A RELIABLE, RAPID-RESPONSE SERVICE

Delivered by our network of regional support teams.

Contact us to find out more: [servomex.com/systems](https://servomex.com/systems)

GET THE SPARES YOU NEED TODAY:  
[servomex.com/service](https://servomex.com/service)



# A RANGE OF GAS ANALYZERS TO

# SUPPORT YOUR PROCESS NEEDS

## SERVOPRO

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, Zirconia, Flame Ionization Detection, Plasma and Gas Chromatography – are integrated into flexible analyzers. These 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 Systems (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.

## SUPPORTING



## SAFE AREA



## SERVOFLEX

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 safety requirements, Servomex's SERVOFLEX analyzers make the grade wherever they are used.

## SUPPORTING



## PORTABLES



## 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



## HAZARDOUS AREA



## DF

When your processes need high-purity gas measurements for oxygen and moisture, DF analyzers deliver industry-leading performance that reaches down to the very lowest ultra-trace levels.

Utilizing the exceptional sensing capabilities of Servomex's Coulometric and TDL sensing technologies for the measurement of oxygen and moisture respectively, DF analyzers are optimized for a sensitive and stable analysis at ppm, ppb and ppt levels.

Delivered through the DF-500 ultra-trace oxygen range and DF-700 moisture range, DF products are the recognized standard for ultra-low measurements in the semiconductor, specialty gas, industrial gas and hydrocarbon processing industries.

## SUPPORTING



## HIGH PURITY



Discover our full analyzer range at [servomex.com](http://servomex.com)

# SIGN UP TO SERVOMEX NEWS

GET THE LATEST ALERTS ABOUT  
SERVOMEX SYSTEMS AND PRODUCTS

## 1. VISIT: [servomex.com/signup](http://servomex.com/signup)

When you sign up to receive Servomex emails, you'll be the first to know about our new products. You can also choose to get the latest alerts about downloads, exhibitions, and other Servomex news.

## 2. ENTER EMAIL

Take control of your preferences and make sure you get all the news that's relevant to you.

