

Combustion Applications



POWER INDUSTRY

Large Boilers

Heat rate improvement in any large combustion process has never been more critical. Rosemount Analytical oxygen probes are the ideal tool to help you establish the fuel/air ratios that will yield the best efficiency while reducing NO_x levels. Careful probe placement can also provide a diagnostic tool for balancing burners and/or coal mills. Trust your process optimization to Emerson – the inventors of the original zirconium oxide technology that is still the industry standard for performance.

Gas Turbines

In today's world of high energy demand, Emerson offers low-cost, reliable analytical packages with short deliveries for gas turbine and other combustion processes. Our Gas Chromatographs provide an accurate on-line measurement of natural gas BTU value for more efficient control of turbine combustion. Also, our emissions monitoring packages are designed to meet US EPA and local regulations, and are ideal solutions for Selective Catalytic Reduction (SCR) applications. And our pre-engineered solutions can get your operation up and running quickly.



REFINING/PETROCHEMICAL

Process Heaters Catalyst Regeneration Sulfur Incineration

Energy efficiency has gained renewed importance in process industries. Better control of process units has minimized the amount of waste fuel gas available for burning in boilers and furnaces at the same time as the price of make-up natural gas has skyrocketed. Pressures from local and national environmental regulatory agencies to reduce NO_x and other pollutants require better control for all combustion processes, such as process heater furnaces, boilers, incinerators, spent acid furnaces and catalyst regeneration processes.

Emerson offers solutions for all of these applications including emissions monitoring systems. Outstanding reliability and durability of Rosemount Analytical's analyzer designs will keep you operating at maximum throughput.



STEAM GENERATION

Industrial Boilers

The boiler house is typically the largest user of fuel in any facility and the increase in fuel prices requires that the boilers be operated at the most efficient levels possible. A reliable oxygen analyzer is a key tool for stationary engineers in establishing the ideal fuel/air ratio for combustion.

Many states are requiring some smaller boilers to operate a continuous emissions monitoring system (CEMS). The MicroCEM™ package is ideally suited for smaller combustion processes with many pre-packaged components that minimize installation and startup time.



KILNS

Cement and Lime Kilns

For the most severe environments in your plant, Emerson offers a variety of gas measurement solutions from high-temperature oxygen analyzers to various installation modifications to suit the application. Rugged Rosemount Analytical analyzers supply accurate and reliable measurements, even in the harshest conditions. Some kilns can qualify for alternate fuel combustion which may require additional environmental monitoring. Emerson offers rugged analyzers to meet all your reporting requirements.

>>> Contact Us Worldwide

Emerson Process Management's field offices are your source for more information on the full line of Rosemount Analytical products. Field sales personnel will work closely with you to supply technical data and application information.

For more information on Rosemount Analytical products and their applications, please contact your nearest Emerson field office. To request copies of our literature, call 330.682.9010 or visit our website.

www.raihome.com

>>> Analyze Us

Emerson Process Management the worldwide industry leaders in:

- > **Combustion Analysis and Optimization**
- > **Process Analysis**
- > **Environmental Analysis and Systems**

>>> Analyze It. Prove It.

Let us prove what Emerson Process Management can do for you. Call your Emerson representative today.

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ROSEMOUNT[®]
Analytical


EMERSON[™]
Process Management



>>> **Combustion
Analysis Solutions**

From the source that delivers peak
performance around the clock



When peak performance is critical, trust the experts at Emerson.

Combustion analysis needs to be accurate and dependable – all day, every day – or your operation suffers. With the largest installed base of combustion analyzers worldwide, Emerson Process Management is trusted more than any other company to deliver provable, worry-free Rosemount Analytical combustion analysis solutions. We've earned that trust by providing solutions that set new standards in precision and reliability.

When you rely on Emerson, you can:

- > Improve boiler efficiency
- > Lower fuel costs
- > Increase safety
- > Improve boiler and system uptime
- > Minimize flue gas emissions
- > Reduce installation and maintenance costs
- > Meet regulatory requirements
- > Update existing equipment seamlessly

It all adds up to a more efficient operation and lower operating costs. For more than eighty years, Emerson has been the world leader in combustion analysis, providing the key capabilities needed for optimizing combustion performance: measurement, analysis and integration.

No one can offer a more complete, trouble-free solution.

>>>>> **Identify > Analyze > Improve**
Combustion Analysis

Optimized

You can have confidence in solutions from Emerson. These customers did:



"When operating a coal-fired boiler, the reliable measurement of oxygen is critical for safe and efficient operation.

Calibration and verification of our existing Rosemount Analytical in situ oxygen probes can be accomplished in minimal time with minimal effort. Their individual readings can be used to help detect abnormal burner performance. Rosemount Analytical's in situ oxygen probes have provided us years of reliable service without failure."

John Farmer, *Computer & Instrument Supervisor*
East Kentucky Power Coop., Dale Power Station



"The measurement of oxygen is critical to the operation of our CCR regenerator. The extractive analyzer system we had been using was frequently getting plugged with catalyst fines and condensation, and

caused 7-8 shutdowns each year over a two year period. Rosemount Analytical in situ oxygen probes place the sensing cell into the process and has not plugged yet. We now operate the process with complete confidence in the oxygen reading."

Scott Hailey, *Lion Oil*, El Dorado, Ark.

Rosemount Analytical Combustion Solutions



Oxymitter In Situ Flu Gas Oxygen Transmitter

Oxymitter transmitters provide the optimum in reliability and accuracy, giving your operators the confidence to set combustion fuel/air ratio to the most efficient levels.

- > Accuracy \pm .75% of reading or .05% oxygen
- > 700°C (1300°F) maximum process temperature (1050°C (2000°F) with bypass accessory)
- > Electronics integral to probe or remote-mounted
- > Completely field-repairable
- > HART® or FOUNDATION™ fieldbus communications
- > High sulfur/HCL versions available
- > Advanced diagnostics, including “calibration recommended”
- > Optional autocalibration
- > Capable of process temperatures between 550°C (1022°F) and 1400°C (2552°F)
- > Intrinsically safe



OCX 8800 O₂/Combustibles Transmitter

This rugged, compact unit has two of the world’s most reliable and accurate sensors – the same high-performance oxygen sensor as the Oxymitter – while its unique combustibles detector has proven to be the most reliable on the market.

- > Rugged sulfur resistant catalytic bead sensor (patent pending)
- > Improved temperature control and heater design
- > Vacuum Fluorescent Local Operator Interface (LOI)
- > LOI safety lock-out
- > Improved sensor and sample block temperature stabilization
- > Line voltage diagnostics
- > Calibration check and abort feature
- > Backward compatibility to upgrade your existing OCX
- > HART® communications



Model 700 On-line Field-Mounted Gas Chromatograph

Whether it's heating value measurement, trace contaminant monitoring, product quality or process control, the Model 700 is flexible enough to cover a broad analytic range. Based on proven technology and software, it offers lower installation and operating costs, greater application flexibility, legendary reliability and precision and unmatched measurement performance.

- > One package for complete BTU/CV measurement
- > Compositional analysis for gas turbine control
- > Flare gas analysis for BTU, H₂S and HR-VOCs
- > No shelter or instrument air required
- > Longest chromatograph valve and column warranties available
- > Highest stated precision (\pm 0.25 BTU/1000 for ambient C6+ analysis)



OPM 3000 & 4000 Opacity Monitors

The OPM 4000 is an EPA-certifiable double pass transmissometer which uses a unique frequency pulsed incandescent lamp to measure opacity. This easy-to-install unit can be set up and serviced by a single field technician and meets all the current EPA requirements. The OPM 3000 uses the same technology for it's measurement but does not come with the factory certification for EPA compliance. This monitor can be used for a variety of applications where EPA reporting is not required but particulate or smoke density may be a helpful process measurement such as bag house or electrostatic precipitator monitoring.

- > Single source dual detector measurement compensates for lamp aging
- > Control room display of opacity or particulate
- > Simple alignment with no additional tools required
- > On-stack maintenance display for easy audits and trouble shooting



CCO 5500 Carbon Monoxide Analyzer

The CCO 5500 is an across-the-stack infrared gas filter correlation analyzer used to improve combustion efficiency. This easy to configure and install device can be used to help reduce unburned fuel as a result of incomplete

combustion. The across the stack CO-specific measurement minimizes the effect of stratification and can help reduce energy costs for any boiler, process heater or other fossil fuel fired combustion process in your facility.

- > Easy to use, program and operate
- > Easy to understand control room diagnostics
- > In-situ/across the stack measurement
- > Rugged easy to install & align optics

We invented the original zirconium oxide technology that is still the industry standard for quality and reliability.



MicroCEM™ Compact Continuous Emissions Monitoring Systems

The Rosemount Analytical MicroCEM is a compact, easy to install package that uses proven extractive monitoring technology, coupled with state-of-the-art measurement detectors. A semiconductor industry-standard PC-104 electronics platform provides maximum measurement, communications and processing capabilities. All measurements are made using US EPA reference method technology. This preengineered package can significantly reduce a facility's start-up time.

- > Compact, accurate and powerful multi-channel emissions monitoring system
- > Full computer networking capability via embedded Windows operating system
- > Plug and play HTML "web-browser" remote access
- > Full-featured password security
- > 90+ days on-board data backup including calibration logs
- > Robust sample conditioning components – heated sample line is not required
- > Easy to install NEMA 4X design (-30° to 50°C ambient temperature range)



Continuous Emissions Monitoring Systems (CEMS)

Emerson offers cost-effective, pre-engineered CEMS packages for applications that require monitoring of up to five gases (and opacity when needed).

- > Measurement options: CO, CO₂, SO₂, NO, NO_x, O₂, THC and opacity
- > Fully pre-engineered – designed for maximum uptime
- > Utilizes Emerson's own industry-preferred analyzers
- > Self-diagnostics
- > Manufactured under ISO 9001-certified quality standards
- > Optional installation, startup, certification and ongoing service programs available



Pneumatic Power Positioners

Rosemount Analytical power positioners have been satisfying exacting control requirements for decades.

- > Thrust-type piston actuators specifically designed to actuate separated overfire air dampers (SOFA) on tangentially fired furnaces
- > Pneumatic fan/damper actuators provide repeatable, reliable service for boiler air flow control

The PlantWeb® Difference.

Emerson's Rosemount Analytical instruments are part of the PlantWeb field-based architecture; a scalable way to use open and interoperable devices and systems to build process solutions for the future. This architecture can reduce capital and engineering costs, reduce operations and maintenance costs, increase process availability, reduce process variability and streamline regulatory reporting.



The PlantWeb Proof

With PlantWeb digital plant architecture, Emerson delivers what everyone else has missed: proof. Across all industries, we're proving that PlantWeb can increase overall plant efficiency by 2% or more. So you operate more cost-effectively, even as its network of predictive intelligence lets you work more safely by detecting problems before they happen.

PlantWeb can help:

- > Reduce installation, energy and maintenance costs.
- > Lower process variability and improve process diagnostics and safety.
- > Enhance product quality and increase throughput.
- > Meet or exceed regulatory requirements.

Talk to your Emerson representative to find out how PlantWeb can improve your bottom line.

Call your Emerson Process Management representative for more information on all our process solutions.

Also from Emerson:

Process Control



Emerson's Rosemount Analytical process gas analyzers help you achieve higher quality, greater reliability and faster time to market, while steadily advancing productivity and profitability. Featuring the new X-STREAM line of process analyzers which are available as general purpose, field housing and flameproof versions, Emerson helps you precisely and consistently measure the constituents in your process by providing optimal performance in demanding applications.

Liquid Analysis



Emerson is the world's premier provider of liquid analysis solutions featuring products with unmatched accuracy, superior performance and worry-free dependability. Our leading-edge instruments and applications expertise, along with unbeatable customer service and support worldwide help our customers maximize process performance, productivity, and profitability. Our solutions provide reduced installation and maintenance costs while improving process quality. We offer a complete range of analyzers, transmitters and sensors for the continuous online measurement of pH, ORP, conductivity, dissolved oxygen, ozone, chlorine, turbidity and total suspended solids.