CONTINUOUS EMISSIONS MONITORING SYSTEMS

Turning emission raw data into insight

Better for the environment, better for your business

FLSmidth

WE DISCOVER POTENTIAL

How can you reduce your environmental footprint and still be profitable?

This is the question that keeps heavy industry up at night.
Everyone is under pressure: Bring down costs. Comply with emissions regulations. Increase productivity. Be more efficient. Win a greater market share.

But the good news is, you're not in this alone. With our Mission-Zero 2030 sustainability goals, we've pledged to help bring emissions from the cement and mining industries **down to zero by 2030**. We are committed to utilising existing technologies and finding new ways to make this happen. We're excited about the potential that lies ahead.

Greater understanding of your process leads to better management

Emissions monitoring is a key first step in reducing your environmental footprint. Exhaust gases tell a story about what's going in your process and the implications that has on the whole system. With the right data to hand, you can adjust your process to minimise emissions and increase efficiency. Small changes can have a big impact – both on the planet and on your bottom line. That's how an emissions monitoring system can improve your performance.

Emissions compliance, taken care of

Globally, emissions regulations are complex and inconsistent. While one country might be concentrating on mercury, another will be cracking down on NO_x or CO. There's no one-size-fits-all compliance solution because the regulations themselves vary so widely.

As a global supplier with an in-depth understanding of the market in which you operate, we're able to navigate these variables and design an emissions monitoring system that works for you. Sure, regulations have never been so stringent – but the technology is up to speed. We can make you more efficient. We can help you lower costs. We can give you the insight you need to ensure exceedances do not happen.

Let's put an end to those sleepless nights and get to work on a solution.

Process insights that help keep you in compliance

Your process is complex and the penalty for exceeding emissions allowances is severe. But the good news is, we can give you the insight you need to ensure exceedances do not happen.

What emissions measurements do you need to know?

Cement and other combustion industries are dealing with a multitude of gaseous and particulate emissions. Our technology is designed to be adapted to your needs, measuring components such as O_2, CO, CH_4, CO_2, NO_X, SO_2, VOC, HCl, HF, NH_3, H_2O, Hg, as well as dust (PM), opacity, flow, temperature and pressure. This flexibility ensures you always have the information you need, when you need it.

Bespoke emissions monitoring systems

We work with you to determine the optimum solution for your specific needs. After an initial site visit and a conversation, we can work out what and where you need gas analysis according to your regulatory requirements, production permits and plant layout. Most systems are installed in the stack using a combination of extractive and in-situ systems to give you the best overall picture of your process gases.

Reliable. Robust.

Emissions monitoring systems keep you in the loop with what's going on in your process. When your monitoring system goes down, you're effectively running the kiln blind. No combustion process can afford to be in the dark on what's coming out of the stack.

That's why all our solutions are carefully designed and selected to be robust and reliable. Minimal maintenance. Minimal interference. Just optimum performance.

Process knowhow

With more than 30 years' experience in gas analysis and emissions monitoring, and many more decades spent working in cement and combustion industries, you can trust us to take care of this for you.

Our gas analysis and emissions monitoring business is based in Mariager, Denmark, where we test and document all of our solutions in accordance with our quality management system. We also have production and service facilities in Chennai, India. We have a wealth of process knowhow, providing gas analysis and emissions monitoring solutions around the world for a multitude of applications:

- Kiln control and optimisation;
- Filter protection;
- Emissions monitoring;
- Emissions reporting;
- Safety measurements, etc.

GASloq: a complete gas analysis system, with expertise built in

Modern plants have a broad range of analysis needs. Our GASloq system is equipped with the tools you need to sample and analyse all this information and turn it into data that will help you improve efficiency and sustainability.

If you have your own analyser room, the GASloq 1200 system can be installed there. Otherwise, the GASloq CUBE is a Plug and Play solution that provides the perfect housing for your gas analysis system, giving you room to work and optimum temperature control for your analysis equipment.

Whether in or out of the GASloq CUBE, every GASloq system comes complete with:

Gas sampling

Our systems are based on extractive gas sampling. Probes continually remove gas samples from the process or stack and draw them up through a sample hose to the gas conditioning unit. The correct probe system is chosen based on the actual measuring needs.

Gas conditioning

The gas conditioning unit is individually designed for each application, depending on the gases, the contaminants, etc. It prepares the sample for analysis to ensure the most accurate read. Gas conditioning is offered in a range of different configurations. The standard is cold dry extractive analysis at 5°C, meaning that the gas sample is dried as it passes through the cooler and is delivered cold (5 ˚C) and dry (with a limited amount of water vapour present) to the analyser.

Gas analysis

We don't produce our own gas analysers, so we're free to choose from the best available technology in accordance with the requirements of your application. Siemens, Durag, ABB, Rosemount/Emerson and NEO are among our most frequently used suppliers.

Control

All operation and supervision of the gas analysis system is performed from the GASloq cabinet through the HMI. The PLC controls the function of all connected instruments and components. External communication from the GASloq system can usually be matched to your plant control system.

Adding analysers is simple

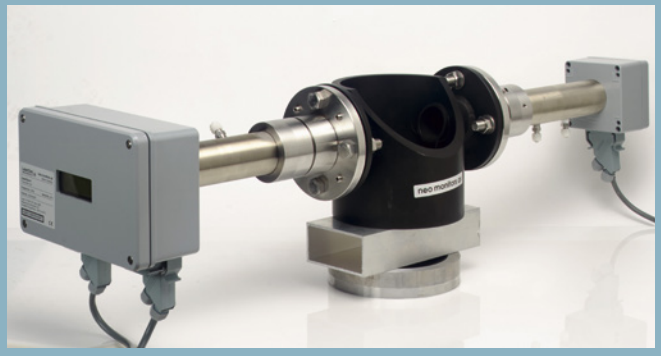
The GASloq system is designed to adapt to your needs. It measures CO, NO_x, SO_2 and O_2 as standard. But if you want to measure other components, such as H_2O, NH_3 or HCl, or simply require a CO and O_2 CEMS system, we will design your emission solution accordingly.

Complementary emission products

In some cases, regulation requires additional measurement to the GASloq emission package, and thus we also provide certified in-situ instruments, such as the Endura AZ20 and the NEO Lasergas Monitor.

Endura AZ20

The AZ20 from ABB provides in situ measurement for optimum combustion control and emissions monitoring. It benefits from a robust, long-life probe that can withstand process temperatures up to 800˚C, as well as easy configuration and consistent, long-term accuracy.



NEO Lasergas Monitor

The NEO Lasergas is typically used to measure HCl, HF, NH_3 or H_2O. It is designed for in-situ measurement in stacks, ducts or reactors, though it is also possible to use it for extractive gas sampling. This analyser uses Tuneable Laser Absorption Spectroscopy – i.e. a non-contact method, which significantly reduces the maintenance requirements. Measurements are fast and accurate, giving you optimum results.

Robust. Reliable. Accurate. An analyser you can depend on.

There are two important considerations when choosing an analyser for your emissions monitoring system: accuracy and reliability.

You need an analyser that can perform on a long-term basis, not one that's going to cause more headaches than it solves. The ACF5000 is a multi-component FTIR emissions monitoring system from ABB, and it is one of the best analysers on the market.

The ACF5000 delivers on both our priorities, providing high levels of accuracy and reliability through FTIR technology. FTIR uses infrared light to measure gases in a well-defined wavelength range, with the exception of O_2, which is analysed in a zirconium oxide cell and the VOC which is measured in a built-in FID module. The ACF5000 can perform continuous, quantitative and selective measurement of up to 15 components as standard, including: HCl, HF, H_20, CO, CO_2, SO_2, NO, NO_2, CH_4, NH_3, N_20, H_2CO, O_2 and VOC. Further components can be added on request.

The ABB FTIR Analyser is certified according to European Norm 15267 and EN14181 and also complies with US EPA 40 CFR 60 and 40 CFR 75, making it suitable for emissions monitoring worldwide.

Cost-effective and time-saving

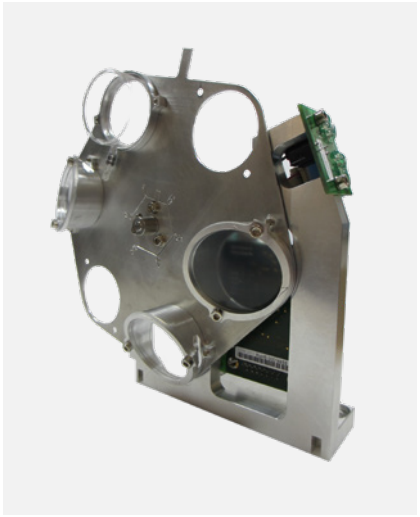
The ability to measure multiple components with one sensor makes this an extremely cost-effective analyser. Even more so because the simplicity of the design, with no moving parts, keeps maintenance requirements to a minimum. In fact, this analyser has a 12-month maintenance interval – far longer than its closest competitors.

The hot wet extractive measurement technique, which enables measurement of the gas-sample at a temperature of ~180°C, enables water vapour to be measured and allows a reading of even very low levels of pollutants such as HCl, HF and NH_3, which are impossible to measure in cold dry systems.

Easy QAL3 testing

The ACF5000 can also be equipped with an internal validation unit that automatically monitors analyser performance and can be used as part of a QAL3 test to report on precision and drift. Data is gathered on a regular basis and used to carry out the calculation for the QAL3 control chart.

This built-in monitoring system reduces the use and associated storage of hazardous test gases, which are now only required around once a year for calibration and linearization of the system if fulfilling the EN14181.



Internal validation unit

Service onsite or off

Should your FTIR analyser require additional servicing, we can come to you and service it onsite. We can also connect to the analyser remotely to quickly diagnose and solve any potential problems. Our A-Z service includes commissioning, acute and preventive service visits, full spare parts stock and of course a 24-hour hotline.

Only the best analysers

Low-maintenance Rosemount CT5100 laser technology has been around for over 20 years. During that time, this technology has successfully proven to offer reliability, a long lifetime and instant response time.

Proven laser technology

The Rosemount laser-based CT5100 hot wet analyser system benefits from a simple design and a high degree of flexibility. Its modular layout enables laser modules to be easily replaced on site, ensuring minimum downtime, while the ability to fit six laser modules in total makes it possible to measure up to 12 parameters simultaneously.

Rosemount's CT5100 Quantum Cascade Laser (QCL) – Patented Chirp Technique

Using Rosemount's QCL/TDL technology with patented laser chirp technique expands gas analysis to both the near and mid-infrared range to enhance process insight, improve overall gas analysis sensitivity and selectivity, remove cross interference, and reduce response time.

The patented laser chirp process occurs in under one microsecond, enabling thousands of spectra to be recorded each second, providing very accurate measurements and fast response times.

The simple design of the CT5100 makes it a good alternative to the hot wet FTIR analyser for emission monitoring. Though it has not yet received any European test certificates, it can be used for emission monitoring outside of Europe.

Mercury measurement made easy

The regulation of mercury emissions is a challenge for pyro industries. Fortunately, the HM1400-TRX2 from DURAG is designed to provide reliable measurement in the lowest certified range and to detect both elemental and oxidised mercury.

Most mercury regulations are very strict, obliging you to constantly monitor mercury emissions levels to ensure you aren't exceeding compliance limits. The HM1400-TRX2 is suitable for daily average mercury limit values of 6 µm/m³. It uses CVAAS (Cold Vapour Atomic Absorption Spectroscopy) with dual beam photometer for continuous mercury measurement, ensuring you can abide by monitoring regulations and giving you the benefit of real-time process control.

To give you peace of mind that your readings are accurate, the internal calibration gas generator gives you an automated reference point through which you can keep an eye on drift and conversion efficiency. Meanwhile, the rugged design ensures long-term reliability and minimal maintenance. When it is necessary to replace parts, it is a simple enough task – and in some instances, such as cartridge replacement, it can even be done during operation.

Economic and performance gains with speciation

Being able to measure both total mercury and elemental mercury gives you the advantage of instant feedback on your mercury reduction strategies. For example, if you are introducing new technology or burning different fuels, you will be able to see the impact on mercury emissions in real-time. The HM1400-TRX2 is one of very few analysers to have this capability and also offer simplicity of operation and a very low measuring range. It's exactly what you need in your arsenal if you're under strict environmental controls and experimenting with different ways to bring mercury levels down.

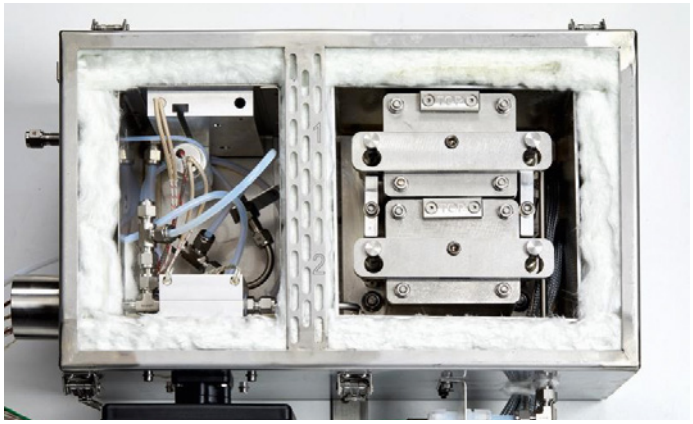


Illustration of two cartridges – for easy replacement

Dust and flow monitors

Your application is unique – that's why we think it makes sense to choose from a wide range of gas analysis solutions. Over the years, we've built up a lot of experience in matching the best instruments with every application.

Measuring dust

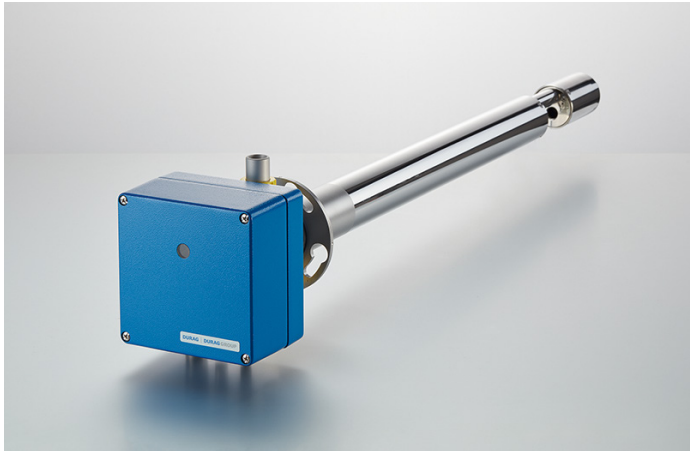
If you're monitoring gaseous emissions, you will likely also be interested in particulates. How much dust is coming out of your stack? What are the characteristics of that dust? Where is it coming from? This is where dust meters come in. Usually supplied as part of a package with the rest of your emissions monitoring solutions, they form an important part of your total environmental picture.

We don't make dust monitors, which leaves us free to choose the most suitable instrument for your application, taking into account the physical characteristics of your process and the degree of accuracy you require. We primarily use dust and flow monitors from Durag, a German supplier with a long history of success in this field. Durag's dust monitoring instruments are reliable, robust, easy to operate and to maintain.

Precise flow measurement

Knowing your gas volume and gas velocity is key to understanding your emissions data. It gives your gas analysis context, enabling you to make sense of your records and pass on accurate data to the relevant local authorities. As an independent supplier, we can choose the best solution for your system – and our experience has taught us that this is almost always a Durag flow monitor.

Precision is guaranteed. Durag's solutions cater for gas measurement in gases below the dew point, at very high temperatures, with high dust concentrations, at low speeds and at high pressure. Maintenance is minimal and requires little effort. The systems are certified according to EN 15267-3, MCERTS and TÜV, so you can be assured they'll deliver on the tasks required of them.



D-R 808 Dust-monitor

The D-R 808 works according to the principle of forward scattering. The concentrated and modulated light of a laser diode penetrates the measuring volume. The forward-scattered light reflected from dust particles is measured and assessed. Used for monitoring small to medium dust concentrations with a certified range of 0- 7.5 mg/m³, this device is for one-side installation without alignment.

- Certified for official emission monitoring
- Space-saving and easy installation
- Low, easy maintenance
- Reliable emissions monitoring thanks to automatic control functions

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D-FL 100 flow-monitor

The D-FL 100 measuring system operates according to the differential pressure principle. The probe has two separate chambers between which the flow builds up a differential pressure. The evaluation unit determines the gas velocity and the volume flow (norm conditions or standard conditions) from the differential pressure, taking into account gas temperature and gas pressure. With this system, you can have continuous measurement of normal volume flow and gas velocity. And it can be operated with or without a control unit, via remote access with web interface. The flow monitor can also be used at high temperature or high pressure and both for large or small stack cross-sections.

D-FL 220 flow-monitor

The D-FL 220 is a measuring system for ultra-sonic measurement of flow and volume flow, especially for wet and aggressive gases. It works according to the acoustic transit time differential method. Two identical transducers mutually send and receive short ultra-sonic pulses. The system calculates the precise gas velocity and volume from the direction-dependent transit time difference. This device provides reliable measurement of gas velocity even at high temperatures. There's an automatic zero point and reference point control. And it can be operated remotely with web interface. As a non-contact system, it's subject to very little wear, giving you maximum availability and reliability.

If you need us, call – no matter where you are

Emission monitoring is at the heart of a plant's compliance programmes. Regular maintenance of your analysis systems benefits both the environment and your business.

We select and design our systems for optimum reliability and performance – but all equipment needs to be looked after if it is to continue performing at the high standards you expect. Regular maintenance of your gas analysis system helps you reduce system downtime and optimise plant performance.

To keep your gas analysis system running smoothly, we provide expert repair and maintenance services, including:

- Commissioning the system
- Preventative maintenance
- Service agreements 24/7 coverage or a yearly visit
- Service hotline and call-outs
- Spare parts
- Training
- Online support and remote troubleshooting
- Consultancy
- Complaint resolution

Flexible service agreements

Service contracts save you money and improve the predictability of maintenance. For example, our service agreement, PlantLine™, provides a range of standardised services, while still offering flexibility. And we also offer online support, enabling better up-time, preventative maintenance, troubleshooting and program updates to be handled remotely – with no delay.

Remote troubleshooting

LiveConnect is our remote preventive service and support offering, which connects over the plant network or 3G. LiveConnect allows preventive maintenance and potential program updates to be handled remotely without site visits. It also supports on-line remote troubleshooting for the local maintenance organization. The Live-Connect setup will not jeopardize plant network safety or bridge firewalls and is fully controlled by the plant, enabling easy on/off operation where applicable.

Fast turnaround on repairs

You can't afford to wait for equipment to be fixed. Our in-house specialised service workshop delivers fast response times and repairs; we promise that we won't take any longer than 12 working days to repair equipment after we have received it.

We carry a full range of spares for major brands and offer calibration, linearisation functions and repair of analysis instruments. We never compromise on quality or safety, and we repair and support the most common gas analyser brands, including:

- ABB®
- Siemens®
- Emerson®/Rosemount®
- Durag®
- NEO™

Industries and applications

We have a full-service programme with built-in process know-how, covering all gas analysis applications.
Industries we service:

- Industries with rotary kilns such as lime, cement, iron ore, etc.
- Waste incineration plants
- Power plants
- Combustion plants
- Fuel gas turbines
- District heating power plants

Onsite assistance

Whether you have a problem already – or you are thinking ahead – we can visit your site to carry out troubleshooting and preventive maintenance.

Spare parts

Spare parts are available on our website **https://airloq.flsmidth.com/shop**. Just enter the item number of the part you need to check the price and availability. We stock all relevant spare parts and part numbers going back 10 years. We continuously update our stocks to ensure that all new products and spare parts are available.

All in all, we offer a full range of world-class services for your gas analysis and emissions monitoring equipment.

FLSmidth

Bringing better solutions to light

in the cement and mining industries

The future is full of possibilities and you are leading the way. But it's never a straight journey and it's easy to lose sight of true potential. With an ally by your side, who shares your ambitions and who sees the world from different angles, we can find the right way together.

For more than 135 years, we have challenged conventions and explored opportunities. Across more than 50 countries, we are 12,000 employees who combine our unique process-knowledge on projects, products and services to drive success. We develop the most advanced technology in our industries and offer market-leading product and service ranges.

Rooted in a culture of honesty, trust and transparency, we activate our knowledge and experience to navigate your complexity and bring better solutions to light. So no matter where in the world you are, we are here to help you discover new ground and achieve sustainable productivity enhancement.

We are the market-leading supplier of engineering, equipment and service solutions to customers in the global mining and cement industries.

We discover potential.

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