

SAFETY & INTERLOCKING GAS ANALYSIS SYSTEM

Gas analysis for **filter protection**



Protecting your equipment and ensuring a safe working environment

Reliable monitoring of process gases protects filter installations against hazardous build-ups of explosive gases. True uninterrupted measurement of these gases ensures there are no safety blind spots that can endanger plant personnel and equipment.

Safety and interlocking gas analysis

Safety is a critical component in any pyro process. Potentially dangerous conditions must be monitored and appropriately dealt with. Failure to do so will endanger plant employees and may damage or destroy costly machinery, resulting in production shutdown.

With 40-plus years' experience designing market-leading gas analysis solutions for the cement, minerals and process industries, FLSmidth has designed a simple and robust double probe system – DDOP: Double Dry nOn-cooled Probe – which enables true continuous gas analysis without any blind periods, thereby optimising plant safety.

Benefits of uninterrupted continuous measurement

DDOP is specifically designed and used for interlocking kiln burners, fans and electrostatic precipitators. The system measures explosive gases, such as CO and CH₄, and provides operational staff with early warnings of explosive gas developments, allowing for fast correction of the burning balance.

DDOP also assists in the identification of possible leakages. It enables the comparison of measurements in the kiln and at the preheater exit. This information supports operators to optimise plant performance.

DDOP is designed for easy, trouble-free installation, operation and maintenance in the harsh, dusty and very demanding cement plant settings and in other similar applications.

Benefits

■ Ensures a safe working environment

■ Protects equipment from damage

■ Prevents production stoppages

■ Offers true continuous gas analysis

■ Includes a direct machine, safety interlocking interface

■ Provides easy, trouble-free operation and maintenance



Technology leadership

FLSmidth leads the way in environmental protection, in part through a dedicated commitment to R&D that ensures cutting-edge technology and an exceptional product portfolio

Air pollution control expertise

Optimised product manufacturing, fabrication and installation make our guaranteed air pollution control (APC) solutions efficient and reliable. And in terms of total cost of ownership, they are among the industry's most economical. To fully maximise the life and productivity of your valuable APC assets it is important to protect them from potentially harmful process gases.

Gas analysis for filter protection

Our DDOP safety and interlocking gas analysis system is suitable for any filter APC arrangement. Its application in an electrostatic precipitator system is where the DDOP system is most valued.

FLSmidth has installed more than 4,000 electrostatic precipitators (ESPs) in a wide range of industries and applications. We know the risks associated with their operation and the importance of dependable continuous gas analysis, before the filter, to safeguard both plant and personnel.

The installation of a filter protection system, that provides interlocking data, is often mandatory in plants where large quantities of explosive gases can be generated.

All equipment for these safety and interlocking purposes is based on a double probe configuration. This allows one probe to be analysing while the other probe is being prepared to take over – enabling uninterrupted analysis without any blind periods. Even short blind periods during probe cleaning are high risk and should be avoided.

A complete solution for safeguarding plant and personnel

Failing to correctly monitor dangerous conditions will endanger plant employees and may damage or destroy costly machinery resulting in long-term production shutdown.

How it works

The DDOP safety and interlocking gas analysis system is designed to operate at high dust concentrations in the preheater exit. The complete filter protection system consists of a double dry non-cooled probe, a probe cleaning panel, heated sample lines and a GASloq™ gas conditioning unit.

DDOP is non-cooled and consists of two separate filter probe tubes. The double probe configuration allows sampling from one probe while the other is cleaned, resulting in true continuous gas analysis and protection from CO/CH₄ peaks. As the gas is extracted from the process, a 180°C heated sample line prevents condensation from occurring before the gas reaches the GASloq gas conditioning unit.

The GASloq system is equipped with two parallel sampling systems that draw gas from each of the two probes. It sends the gas to one common set of analyser units at high speed. During the cleaning of one probe, the other probe continues the analysis unaffected.

The gas conditioning equipment can be supplied in a secure GASloq CUBE site shelter, if required.

Many plants require safety and interlocking systems to be SIL2 approved. If you need this level of protection we can deliver to these requirements.

Scope of supply for a typical filter protection system

- 1 x double probe type DDOP
 - Dust load: max. 200 g/m³
 - Temperature: max. 400°C
- 1 x probe cleaning panel
- 1 x air tank
- 2 x 15 m heating sample lines
- 1 x GASloq 1200 gas conditioning system
 - Hard-wired signals
- 1 x analyser of measuring CO and O₂
- Test gas for analyser calibration

Optional extras

- Analysers for measuring CH₄, NO, SO₂ and CO₂
- PROFIBUS, Ethernet communication
- Site housing: GASloq CUBE Analyser Room
- SIL2 risk-reduction safety upgrade



- 1 Double dry non-cooled probe (DDOP)
- 2 Air tank
- 3 Heat shield
- 4 GASloq 1200 gas conditioning system

Over 4000 ESPs installed
in a range of industries and
applications



We understand **the risks**
associated with ESP operation
and the importance of dependable,
continuous gas analysis



GASloq CUBE site shelter



Convenient online
web shop for
spare parts



shop.flsmidth.com

Gas analysis and reporting solutions

Let our experience and advanced technology deliver worry-free monitoring and reporting. Our advanced gas analysis equipment, reporting and service packages provide peace of mind.

Industries served

Our portfolio of gas analysis and reporting solutions are available for six key industries:

- Cement
- Lime
- Waste
- Power
- Steel
- Nickel

GAS ANALYSIS SYSTEMS

- Probe systems (KilnLoq™)
- Gas conditioning (GASloq) - both cold/dry and hot/wet solutions
- Analysers
 - Oxygen
 - CO, CO₂, NO, SO₂
 - NH₃, HCl and HF
 - Total hydro carbons (THC or TOC)
 - Dust and flow
 - Mercury
- Site housing (GASloq CUBE Analyser Room)

ENVIRONMENTAL REPORTING SYSTEM

- Web-based and stand-alone environmental reporting (ReportLoq™)

LIFE CYCLE SERVICES

- Service agreement (PlantLine™)
 - Advanced troubleshooting
 - Preventative maintenance visits
 - Performance monitoring and remote optimisation
 - Engineering service
 - Managed antivirus
 - Software license upgrade subscription
 - Local language assistance
- Remote technologies (LiveConnect™ and MyPlant app)
- Training courses
- Spare and wear part supply
- Installation and commissioning
- Preventative maintenance
- Repair and calibration
- Upgrades and retrofits
- Online web shop for spare parts: shop.flsmidth.com

Your global partner

For more than 135 years FLSmidth has sold equipment, plants and services to the cement and mining industries.

Today we sell productivity.

Through advanced technology and unique process knowledge, our 12,000 employees across more than 50 countries provide sustainable productivity enhancement to our customers.

We seek to increase our customers' output and decrease their total cost of ownership.



■ Supercentre
 ■ Project and technology centre
 ■ Production
 ■ Sales and services

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