

NICOSYS-3

CO DETECTION

Carbon Monoxide Detection Analyzer

The safety of powder drying has become increasingly important for manufacturers operating in the food and feed industry. The outbreak of fire is a significant risk in these factories, potentially causing serious damage, but demand, energy prices and environmental requirements are increasing. This means manufacturers must balance the need to improve efficiency with keeping their operations continuous, cost-effective and, most importantly, safe.

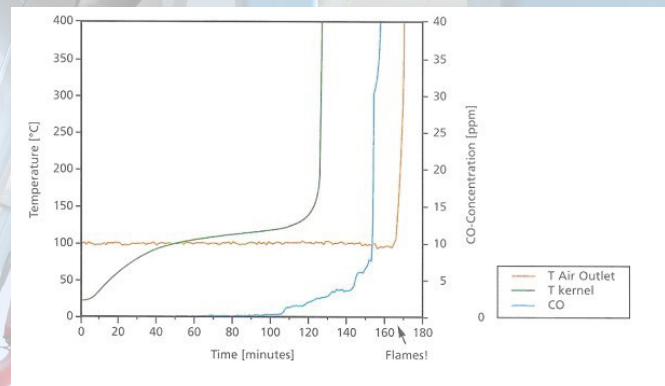
Safety Drivers for CO Detection

CO detection is widely used for pre-warning in dryer installation safety systems. Uncontrolled process conditions can cause the product to coagulate and form lumps, which poses a major risk to the dryer's operation and shortens production cycles between cleaning. Importantly, coagulated products are exposed to increased residence times, which can cause degenerating smoldering reactions, creating a significant risk of fire and explosion.

NICOSYS-3 is a sample conditioning system, that detects CO in gaseous streams. We began developing this system 25 years ago, with NIZO (Dutch National Institute of Dairy Research). The Hobré NICOSYS-3 is the latest version of the system, with condensate coolers, NDIR gas filter correlation analyzer, and sample probes for various applications. The CO detector improves process safety with fast and accurate detection of smoldering and Maillard reactions to reduce fire risk.

Principles

The figure below depicts the temperature trend of the lump kernel and the exhaust air, as well as the CO concentration in the exhaust. It is clear that although the exhaust temperature is not affected by smoldering in the lump, the CO concentration increases steadily for more than 30 minutes before the flames occur and the temperature in the tower starts to rise.



A reliable measurement of the CO levels in the exhaust will therefore warn the operator of possible hazards. Three alarm stages can be installed at different levels, starting from 0,5 ppm. These points can be used to generate an alarm, shut off the system or start a fire extinguishing system.

The NICOSYS-3 monitors the outgoing and incoming CO concentration, to prevent false alarms due to high CO concentration peaks in the wider environment, or background CO caused by trucks, exhaust pipes etc.

Hobré Instruments B.V. only uses reliable components that have proven themselves under the severe conditions in food and feed drying factories, - and we provide the global service and maintenance necessary to keep such installations running.

System performance

- Reliable measurement of CO levels in the drying chamber, fluid bed and bag filter, as well as in the incoming air provides all the necessary information to monitor smoldering in the drying process
- 3 alarm levels. Alarms can be used for early warning, system-, shut-down and fire suppression
- Professional conditioning of the sample under hygienic conditions, preventing clogging and condensation
- Sophisticated alarm handling makes the system highly reliable

Benefits

- Low-cost CO detection system
- Easy to install and maintain
- Reduced insurance costs
- Fast and accurate detection of CO from smoldering and Maillard reactions
- Ensures reliable CO detection by reducing complexity and avoiding false alarms
- Enables preventive measures to minimize downtime
- Built-in automated alarms and I/O's for optimal safety of the powder drying plant.



Technical specifications

General	
Measuring	CO in gaseous streams
Service	Early warning system
Sampling system	Atmospheric
Measuring principle	NDIR gas filter correlation
Sample Probes	
Stainless steel filter probes	High capacity filter probe, Varinline® compatible, DN25
Maximum process temprature	450°C
Sample line	Max. 80m, 8mm outside diameter; no heating
Analyzer cabinet	
Dimensions	2045 x 620 x 900 mm (HxWxD)
Power supply	230/115 VAC 50/60 Hz 2750 watt
Ambient air	Max. 30 °C
Measuring range and accuracy	
Measuring range CO	0 – 200 PPM
Lower detecable limit CO	<0.4ppm or 0.2% of reading whichever is greater
Sample connections	Max. 4 channels
Outputs	
Cabinet	IP56, RAL7035 powder-coated steel
Access	Front door
Weight	Approx 180 kg including packing
Mounting	Floor

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