Mill/Silo Fire Detector

Combustion & Environmental Monitoring

An AMETEK® Company
**Coal Fire Detection**

Advance warning of the onset of coal mill and silo fires through the build-up of carbon monoxide

This unique detection system is specifically designed to detect rapid build-up of carbon monoxide inside pulverizing coal mills and silos. It continuously monitors the atmosphere, and responds very quickly to any significant increase in the levels of CO, created by the onset of a fire. This provides the operator with advance warning to enable preventative action to be taken before damage to the plant, or injury to personnel occurs.

The saving in cost of repairs following a mill fire would pay for the system many times over.

**Features and Benefits**

- Advanced fire detection system - **Protect expensive mill equipment and prevent downtime**
- Specifically designed for fire detection on coal mills and silos - **Robust, low maintenance system**
- Continuous self-checking of measurement integrity - **High level of reading confidence**
- Tailored to each application - **Easily set, site-specific alarm thresholds**
- Easy connection to plant control equipment - **Standard analog & discreet contact outputs**

**Why Carbon Monoxide (CO)?**

Monitoring of CO, as opposed to temperature sensing, provides much earlier detection of combustion and subsequent prevention of a mill fire. The system will detect changes significantly faster - in time to prevent damage.

**How it works?**

It extracts sample gases from the mill (often the mill outlet) or silo and continuously monitors the levels of carbon monoxide (CO). Dual sensors continuously monitor CO, with self-checking and auto-calibration to maintain integrity.

**Alarms**

Alarm threshold levels can be set to best suit the plant operating conditions. These settings can also compensate for externally introduced CO, where mills are using recycled combustion air for coal feed heating.

**Optional O₂ Measurement**

Measurement of oxygen is an option in the single stream instrument. Oxygen-limited silos will benefit from this additional measurement as an additional fire prevention precaution. Similarly, plants using re-cycled flue gas can continuously monitor oxygen levels.
Sample Probe - Mill applications

The specially designed probe is able to withstand the erosive conditions at the mill outlet where the measurement is made. The outer protection tube is cast from erosion resistant material, while the sampling tip has a screw-on replaceable steel filter to protect the sample line and analyzer from dust ingress. The probe and filter are both simple to remove and replace.

Applications

The Mill/Silo Fire Detector is suitable for monitoring on both horizontal and vertical mills, typically on the PF outlet. It is equally effective in monitoring ground coal stored in silos and bins.

- Pulverizing Coal Mills
- Grinding Plants
- Coal Bins
- Storage Silos
- Enclosed Conveyors

Twin Stream System

Where the application specifies, a twin stream system is available. This can simultaneously monitor 2 measurement points on a single mill, or 2 separate mills; reducing installation costs and increasing the protection levels on a single mill.

Multipoint Switching Unit

Where the application allows, a 6-point switching unit is available to sample several points on a single mill or any combination up to single points in six mills. The switching unit is set to sample at customer set intervals for a specified period.

Coal Fire Detection - Product Range

- **Mill/ Silo Fire Detector**
  CO monitor for early detection and advance warning of mill/silo fires

- **Conveyor Fire Detector**
  Early detection of hotspots/fires along the conveyor

- **Railcar Fire Detector**
  Check and detect hotspots and fires in coal railcars

- **IR Coal Fire Monitor**
  Infrared thermometer for detecting fires on the mill/bunkers

- **Coal Pile Fire Detector**
  Early detection of hotspots/fires in coal stockyards

- **Portable Thermal Imager**
  Hotspot and fire detection in bunkers/hoppers/silos and plant integrity checking

Typical Mill Fire Detector installation, with CO detector fitted to PF outlet at mill exit
Further Information

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Specifications

**Analyzer**

**Measurement Ranges**

CO Ranges (selectable): 0-100 up to 4,000 ppm in 50 ppm steps or 0-100 up to 5,000 mg/m³ in steps of 50 mg/m³

Linearly: < 2 % of range

Zero drift: < 2 % of range per month

Span drift: < 2 % of range per month

Optional O₂ Ranges (selectable): 0 - 5 % to 0 - 25 %

Resolution: 0.1 Vol %

Linearly: < 0.2 Vol %

Zero drift: < 0.2 Vol % per month

Span drift: < 0.2 Vol % per month

Response time: < 30 secs. to T₉₀ (excluding sample line)

**Calibration**

Calibration method: Automatic

2-point calibration span and zero

Microprocessor controlled

**Display**

Type: LCD (Supertwist)+ LED backlight

Size: 60 x 16 mm / 2.4 x 0.6 in

Parameters: 4 x 20 character dot matrix, 8 access keys

**Indicators**

Type: 2 LEDs on door panel

Use: ‘Power On’ and ‘System OK’

**Outputs/ Inputs**

Analog output: Single, isolated current loop for each CO level & O₂ if fitted

0, 2 or 4 mA to 10 or 20 mA

2 x Level Alarms; System OK; Calibration/Maintenance

Relay rating: Isolated changeover S.P. 1 A @ 240 V a.c.

or 5 A @ 240 V d.c. resistive

Auto cal relay contacts: Zero, Span check/calibration

Auto cal initiation contacts: For use with external contact closure

**Environmental**

System enclosure: Painted steel, sealed IP65 / NEMA 4

Operating (ambient) temperature: 0 to +45 °C / 32 to 113 °F standard

to -20 °C / -4 °F with optional case heater

+50 °C / 122 °F with optional air conditioner

**Compliance**

EMC: Conforms to EN-50081 & EN-50082

Electrical safety: Conforms to EN-61010-2

**Power**

Power supply: 83 V a.c. to 132 V a.c. or 165 to 264 V, 50 - 60 Hz

Power consumption: 300 W

**Gas and Air requirements**

Instrument air (zero calibration): 2 bar / 30 psi clean and dry, 5 l/min / 0.2 cfm

Instrument air (cooling): 5 - 10 bar / 70 - 150 psi clean and dry, 300 l/min / 10.5 cfm

Calibration gas: CO in N₂; Air for O₂

Calibration gas type: 20 litres (0.7 cu.ft.) per calibration approx.

**Dimensions**

(H x W x D): 600 x 600 x 350 mm / 24 x 24 x 14 in

Weight: 53 kg / 117 lb

**Options**

Twin Stream System

Heating/Cooling

Multi-point Switching Unit

Sample Probes and Lines

Oxygen Measurement (Single stream only)

Continuous product development may make it necessary to change these details without notice.

LAND has a comprehensive range of Combustion and Environmental Monitoring Instrumentation.