

FORNEY

ANALYZERS

Compliance, process and safety instrumentation



F-8010 Cross-Duct Carbon Monoxide Analyzer

FORNEY F-8010 CROSS-DUCT CARBON MONOXIDE ANALYZER

SYSTEM FEATURES

- No sampling system to maintain
- Minimal lens contamination
 - high-efficiency air purges to maintain optical efficiency
- Automatic on-line zero calibration
 - continual correction using integral reference gas cell
- Real-time normalization
 - to standard reference conditions
- Low maintenance overhead
 - only simple, infrequent checks of the quartz lenses required
- Choice of data presentation
 - ppm, mg/m³ and mg/Nm³
- Optional independent verification
 - using Forney certified test cells
- One year parts and labor warranty

The F-8010 Cross-Duct Analyzer was developed for use on large Power Generation, Cement, Chemical and Incineration plants and is the industry standard for reliable, low maintenance CO analysis throughout the world. The analyzer may be used as a complete stand alone monitor or as part of an integrated emission monitoring system. The instrument is suited for large - dirty processes.

The F-8010 is designed to operate on duct widths from 1m to 8m and flue gas temperatures up to 300C. Their rugged construction makes installation and operation extremely simple, and the use of microprocessor technology offers many advanced features, including:

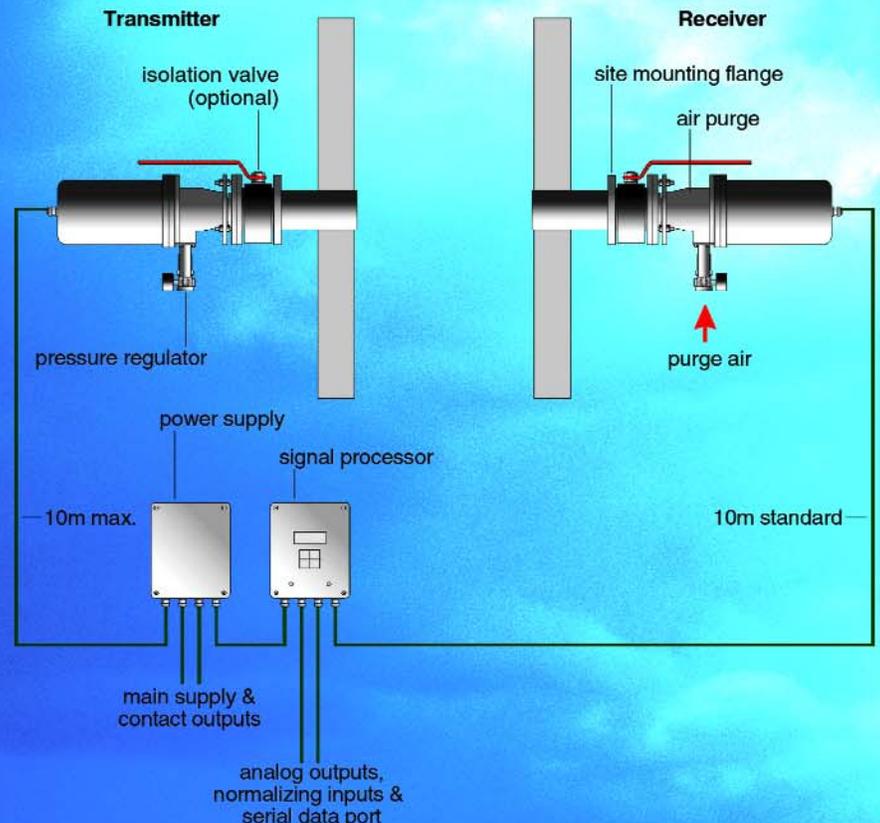
- Local temperature, pressure and oxygen inputs for normalization to ambient conditions
- Serial data facility for communication between analyzers and central data logging station
- User-definable output in either mg/m³, mg/Nm³ or ppm
- Four rolling averages are stored - selectable from 10 seconds to 30 days
- Integral, back lit LCD provides diagnostic and measurement information
- Plant status input for data validity during plant outages.

SYSTEM DESCRIPTION

The F-8010 consists of four main items:

- Infrared transmitter unit to project a beam of infrared radiation across the duct
- Receiver to measure that radiation
- Power supply unit to provide the necessary power rails, and
- Signal processor to compute the gas concentration from the signals provided by the receiver unit.

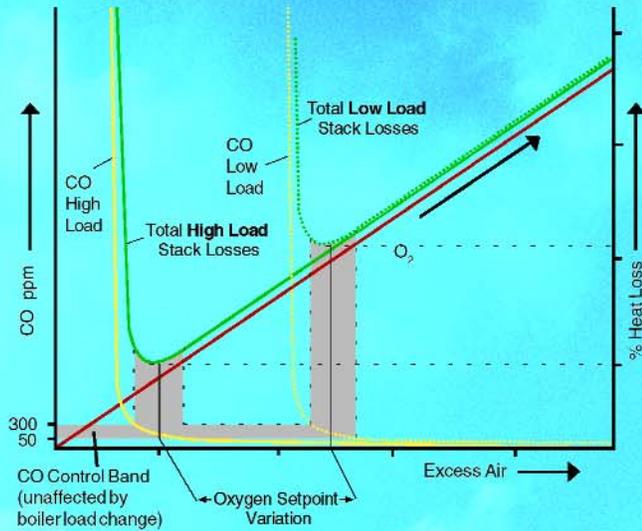
Each of these units is designed to be rugged and durable. They are all fully sealed to IP 65 standards and are suitable for outside mounting, without the need for further weatherproof enclosures.



COMBUSTION EFFICIENCY

Carbon Monoxide (CO) is formed due to the incomplete combustion of carbon based fuels such as coal, oil and natural gas. Increased CO indicates an inefficient combustion process. Typically, boilers run for long periods of time at a single load setting. However, when process requires boiler load changes, the need for air/fuel ratio adjustments are essential.

The chart illustrates the relationship of CO, Oxygen, and heat loss. The Optimum Carbon Monoxide control band is independent of load.

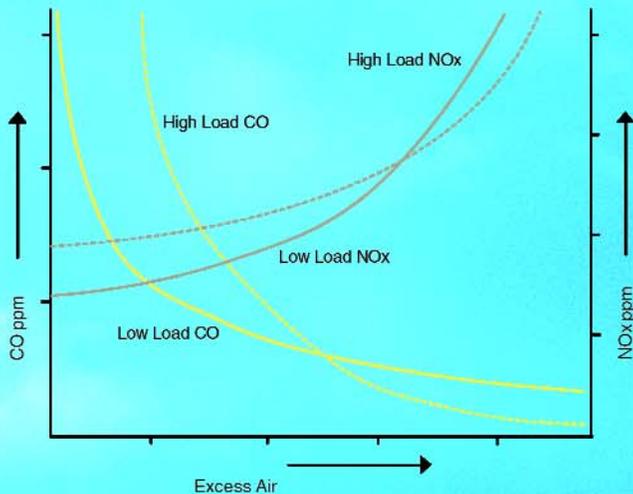


SCOPE OF DELIVERY

- Transmitter with 10m cable
- Receiver with 10m cable
- Mounting Flanges
- Signal Processor / PSU
- Air Purge for Transmitter and Receiver
- 4 - 20mA Output

OPTIONAL ACCESSORIES

- Compressed air actuated fail-safe shutters
- Calibration check cells and cell test jig
- Air Purge System for high pressure duct/stack applications (110/220VAC required)



PRINCIPLE NOx REDUCTION USING CO CONTROL

Optimizing boiler emissions is achievable by controlling the amount of excess air in the burner combustion process. Since NOx levels increase non-linearly over the load range and are directly affected by the amount of excess air in the burner (as illustrated in the chart). Continuous measurement of CO allows fine control of excess air, resulting in improved emissions performance.

HOW THE FORNEY F-8010 WORKS

The Forney F-8010 projects an infrared beam across the duct and through the flue gas to a receiver unit. The light beam is tuned to a specific wavelength where CO molecules absorb light energy. The wavelength is chosen specifically to ensure no interference from other gases or water vapor. The more CO molecules there are in the light beam the greater the absorption.

To isolate the interference for dust particles the Forney F-8010 also uses the principle of Gas Filter Correlation (GFC) where a live and reference measurement are generated in the receiver. The live measurement is sensitive to changes in energy caused by CO or dust. The reference channel is desensitized to CO using a high concentration gas cell. Therefore, the difference between the live and reference channels is a function of CO concentration.

**Contact the factory or your local Forney representative
to learn more about the full line of Forney products.**

- **Flame Detectors**
- **CEMS and Analyzers**
- **Burner Management Systems**
 - **Burners**
 - **Duct Burners**
 - **Igniters**

Forney's factory trained technicians provide safe and efficient execution of all your service agreements, including PM contracts, Start-up and Commissioning Services, Outage and Product Support.



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