



## EMIRAK Continuous Emissions Monitoring System

- MCERTS accreditation
- Complies with EN15267 - 3
- User friendly computer driven interface
- SHEWHART and CUSUM functions
- Wide choice of enclosures - mobile vans, cabins



### Overview

Emirak is an extractive multigas analyser system for continuous emissions monitoring. It is normally used to measure the concentration of oxides of nitrogen (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), oxygen (O<sub>2</sub>), hydrocarbons (HCs) and water vapour (H<sub>2</sub>O) in the flue gas of large combustion processes, incinerators and other processes when it is required by legislation.

### Operation

EMIRAK is a modular system based on a set of intelligent modules communicating via an internal data highway and a bus master, with a centralised control computer. There are three different types of modules: analyser, sampling control and interface modules, each controlled by dedicated microcontroller. These microcontrollers collect data every second and prepare one minute files consisting of averaged measurements, diagnostics and mode of operation. The microcontrollers are co-ordinated by the system control computer, equipped with Emilog, a complete software package providing centralised supervisory control as well as logging and reporting facilities.

The Plant Interface Modules (PIM) enable other external instruments to be incorporated in the Emirak system to take advantage of the data processing, display, logging and reporting facilities.

With EMIRAK, the flue gas is sampled using an extraction package controlled by the sampling control module and maintained at 180 °C. This package comprises probe, heated filter, heated line, and heated pump, and provides a clean hot sample gas to those analyser modules requiring the sample to be maintained above water, hydrocarbon and acid dewpoints. The sample gas also passes through a chiller kept at 3 °C where the water and acids are removed as they form by a dedicated peristaltic drain pump. The sample, pressurised to 1.33 atmospheres by the pump, has a water dew point at 3 °C, equivalent to the dew point at 0 °C and atmospheric pressure. Removal of water to meet legislative requirements is therefore achieved without "icing" problems.

### Specification

Measurement technique	Chemiluminescence for NO <sub>x</sub> FID for hydrocarbons NDIR for CO, CO <sub>2</sub> , SO <sub>2</sub> Dual zirconia for wet O <sub>2</sub> and H <sub>2</sub> O Paramagnetic for dry O <sub>2</sub>
Measuring range	0-50ppm to 0-100ppm NO <sub>x</sub> as NO <sub>2</sub> 0-100ppm to 0-1000ppm CO 0-85ppm to 0-425ppm SO <sub>2</sub> 0-25% O <sub>2</sub> (wet and dry)
Response time	20 seconds to T <sub>90</sub> excluding sample line
Accuracy and repeatability	Better than 1% FSD
Drift	Zero and span: Less than 3% between maintenance intervals
Noise	Better than 1% FSD
Linearity	Better than 2% FSD
Concentration outputs	0-10Vdc or optional 4-20mA isolated
Power	110/230VAC, 50/60Hz 1 or 3 phase Power consumption depends on heated line length