

# Multi-Gas NDIR-GFC analyzer

PROCESS & EMISSIONS MONITORING SYSTEMS

Ideal for highly soluble and corrosive gases, the MIR 9000 is a highly accurate analyzer, measuring simultaneously up to 10 parameters among: HCl, HF, NO, NO<sub>2</sub>, N<sub>2</sub>O, SO<sub>2</sub>, CO, CH<sub>4</sub>, TOC, CO<sub>2</sub> and O<sub>2</sub>.

**CD** Cold Dry Extractive sampling  
(Dry Basis Analysis)

## SPECIFIC FEATURES:

- Non-Dispersive Infrared Gas Filter Correlation technology
- Offers excellent performance for multi-gas measurements
- Built-in paramagnetic cell for O<sub>2</sub> monitoring
- Automatic cross interference correction
- Intrinsic security based on residual H<sub>2</sub>O measurement
- Excellent stability with automatic optical stability check
- Real time graphic display with interactive menu-driven software for ease of operation
- Ideally used with SEC™ permeation sample drying technology and non-heated sample lines for cost effective operations
- Built-in data logger for 7 additional parameters (flow, pressure, temperature or any other analogue input)
- Remote access for maintenance and data recovery
- Optional Chemiluminescence module (CLD) for low NO, NO<sub>x</sub> and NO<sub>2</sub> measurement
- Optional Flow, Temperature & Pressure calculation when associated to compatible sampling system
- Over 4.000 installations worldwide, in a wide range of applications and industries
- QAL1 certified Automated Measuring System by the TÜV and the MCERTs



MIR 9000 - tight box version

Highly versatile, the analyzer is available in 4U, 19" Rack or Tight box enclosures to fit your application.



MIR 9000 - 19" rack version

## MAIN APPLICATIONS:

- > Municipal and Hazardous Waste Incinerators
- > Cogeneration, Gas Turbines (MIR 9000CLD model)
- > Industrial Boilers and Furnaces, Power & Combustion
- > Cement Kilns, Glass, Chemical & Petrochemical Plants
- > DeSO<sub>x</sub> unit process control (MIR 9000ASD model)

## COMPLIANCE WITH:

International and EU Regulations: IED (WID) / LCPD / MCP directives, US EPA (40 CFR 60 & 75)...



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance  
[www.tuv.com](http://www.tuv.com)  
ID: 000024158



Sira MC020010/13  
MCERTS CERTIFIED  
EN 15267-3

**QAL 1**  
EN 15267-3

**QAL 3**  
EN 15267-3

# Multi-Gas Non-dispersive Infrared GFC Analyzer **MIR 9000**

Lowest / highest standard ranges	
HCl	0-15 / 5 000
HF	0-20 / 300
NO	0-100 / 5 000
NO <sub>2</sub>	0-100 / 1 000
NO <sub>x</sub>	0-200 / 5 000
NO <sub>x</sub> (CLD)	0-20 / 2 000
N <sub>2</sub> O	0-20 / 1 000
SO <sub>2</sub>	0-75 / 5 000
CO	0-75 / 10 000
CH <sub>4</sub>	0-10 / 1 000
TOC	0-50 / 5 000
CO <sub>2</sub>	0-10 / 100%
O <sub>2</sub>	0-10 / 25%

Expressed in mg/m<sup>3</sup> or % when indicated.  
For other gases, please contact us.

## MAIN OPTIONS:

- Pressure, temperature & gas velocity measurements (DTP)
- Analog outputs: 0-1/10V - 4-20 mA programmable
- Chemiluminescence (CLD) module for low concentrations of NO, NO<sub>x</sub> & NO<sub>2</sub>
- UV absorption module (ASD) for SO<sub>2</sub> selective and dynamic measurement
- Built-in Paramagnetic or Zirconia cell for O<sub>2</sub> monitoring
- NO<sub>x</sub> converter (external)

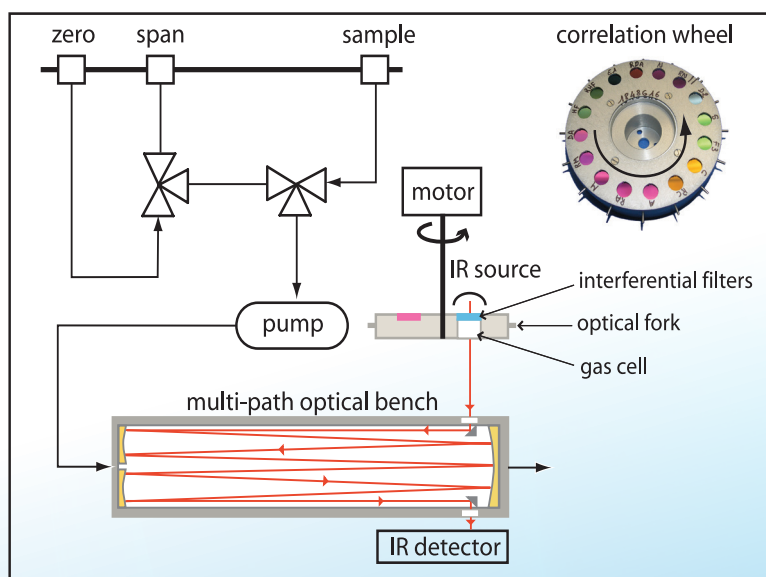
## PRINCIPLE OF OPERATION:

NDIR GFC principle. Multi reflexion on mirrors to improve the path length (more than 12 meters) and thus the sensitivity.

Use of interferential filters (optical filter or gas cell), that defines a specific wavelength area for a dedicated compound. Few interferential filters are needed to cover the complete range of parameters. Those filter are positionned onto a wheel that is turning at a high speed (more than 1000 rpm). The GFC (Gas Filter Correlation) principle coupled to IR is a way to avoid the cross interferences between some compounds present into the sample' matrix.

The GFC uses a cell filled with highly concentrated gas (parameter/compound that needs to be measured) and a cell filled with 100 % nitrogen, which does not absorb any wavelength in the IR. They are embedded onto the wheel also called correlation wheel. The result is the measurement by the IR detector of two energies (reference energy "I0" and measure energy "I").

The absorption of the infrared energy follow the Beer Lambert law. Therefore, after absorption by the gas, the ratio between the reference energy "I0" and the measure energy "I" is known at any moment. Hence, the gas concentration can be deduced, using a formula based on the different energies ( $C=f(I/I_0)$ ). The main interferents, if any, are eliminated (their absorption are also part of I0 and I measurement and thus are not influent into the final calculated concentration).



## TECHNICAL SPECIFICATIONS

Repeatability	<2% of Full Scale (F.S.)
Zero drift	<2% F.S. / 30 days
Span drift	< 1% F.S. / 7 days
Linearity	< 1% F.S.
Power supply	80-230V, 50-60 Hz
Energy consumption	300 VA
Serial link	RS232, RS 422
Communication	TCP IP / Ethernet RJ45
Operating temperature	+5°C to +40°C
Version tight box (without CLD or ASD)	Dim. : 200x400x600 mm (DxWxH) Weight : 24 Kg
Version 19" Rack (without CLD or ASD)	Dim. : 490x483x177 mm (DxWxH) Weight : 14 Kg

## Complete systems would include:

- Sample extraction probe (with or without integrated temperature, pressure and flow measurement)
- SEC® sampling system (permeation based) or gas cooler
- Sample lines
- Multiplexing system (MVS)
- Automatic calibration units (TIG)
- Instrument air drying system (MDS)
- Rack cabinet, cubicle or shelter integration
- WEX™ data acquisition, management & environmental reporting software (DAHS)

