Gasmet™ DX-4000

Multicomponent FTIR Gas Analyzer

GASMET ON-SITE SERIES includes portable multicomponent gas analyzers for demanding applications. The GASMET Dx-4000 incorporates a Fourier Transform Infrared, FTIR spectrometer, a temperature controlled sample cell, and signal processing electronics. The analyzer offers versatility and high performance for all users.

The GASMET Dx-4000 is designed for short term on site measurements with wide dynamic ranges. It is an ideal tool to measure trace concentrations of pollutants in wet, corrosive gas streams. The sample cell can be heated up to 180 °C. Sample cell absorption path length is selected according to the application.

The GASMET Dx-4000 allows simple calibration using only single component calibration gases. The user can easily configure the analyzer for a new set of compounds.

General parameters	
Measuring principle:	Fourier Transform Infrared, FTIR
Performance:	Simultaneous analysis of up to 50 gas compounds
Response time, T_{90}:	Typically < 120 s, depending on the gas flow and measurement time
Operating temperature:	Short term 0 - 40°C long term 5 - 30°C non condensing
Storage temperature:	-20 - 60°C, non condensing
Power supply:	100-115 or 230 V / 50 -60 Hz
Power consumption:	300 W

Spectrometer	
Resolution:	8 cm^{-1} or 4 cm^{-1}
Scan frequency:	10 scans / s
Detector:	Peltier cooled MCT
Source:	SiC, 1550 K
Beamsplitter:	ZnSe
Window material:	ZnSe
Wavenumber range:	900 - 4 200 cm^{-1}

Sample Cell

Structure:	Multi-pass, fixed path length 5.0 m
Material:	100 % Rhodium coated aluminium
Mirrors:	Fixed, protected gold coating
Volume:	0.4 l
Connectors:	Inlet Swagelok 6 mm Outlet Swagelok 8 mm
Gaskets:	Viton® O-rings
Temperature:	180 °C, maximum
Window material:	BaF_2

Measuring parameters

Zero point calibration:	24 hours, calibration with nitrogen (4.0 or higher N_2 recommended)
Zero point drift:	**<** 2 % of measuring range per zero point calibration interval
Sensitivity drift:	none
Linearity deviation:	< 2 % of measuring range
Temperature drifts:	< 2 % of measuring range per 10 K temperature change
Pressure influence:	1 % change of measuring value for 1 % sample pressure change. Ambient pressure changes measured and compensated

Electrical Connectors:

Digital Interface:	9-pole D-Connector for RS-232 Analyzer is connected to an external computer via RS-232C cable. The external computer controls the GASMET. Remote control connection for Portable sampling unit
Power connection:	Standard plug CEE-22
PSS connection:	Remote connection of PSS (Portable Sampling System)

Gas Inlet and Outlet Conditions

Gas temperature:	Non-condensing, the sample gas temperature should be the same as the sample cell temperature
Flow rate:	120 - 600 l per hour
Gas filtration:	Filtration of particulates (2µ) required
Sample gas pressure:	Ambient
Sample pump:	External, not included

Electronics

A/D Converter:	Dynamic range 95 dB
Signal Processor:	32-bit floating point DSP 120 MFLOPS speed
Computer:	External, not included

Analysis Software (for external PC)

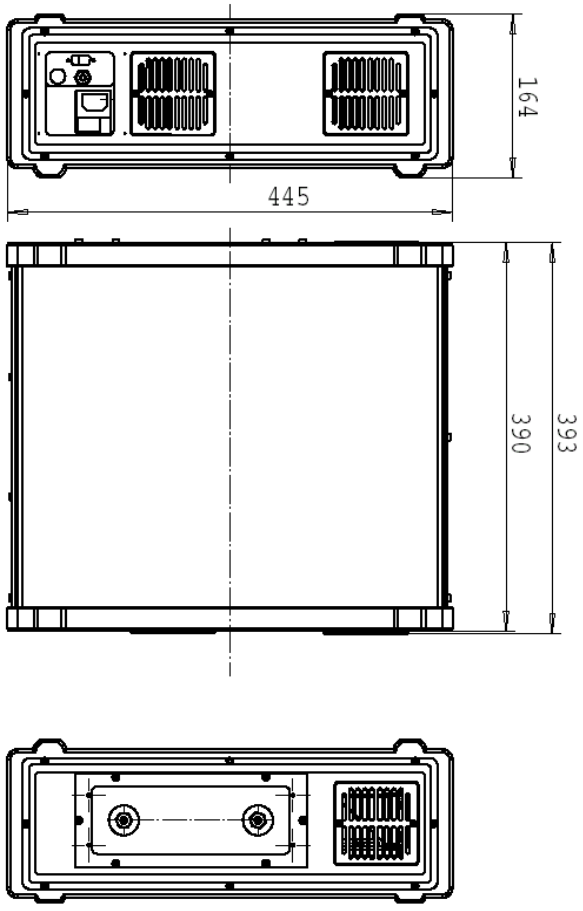
Operating system:	Windows XP
Analysis software:	CALCMET for Windows

Options

Sample Cell:	Multi-pass, fixed path length 2.5 m or 9.8 m
Pressure measurement:	Inside sample cell
Analog Signals (ext PC):	ADAM 5000/TCP module (for analog inputs, outputs, relays)
Sample cell gaskets:	Teflon® coated Viton® **or** Kalrez®
Trolley:	Wheeled cart for the analyzer and laptop computer

Enclosure

Material:	Aluminium
Dimensions (mm):	390 * 445 * 164
Weight:	13.9 kg
CE - Label:	According to EMI guideline 89/336/EC



Gasmet™ in emissions monitoring – applications:

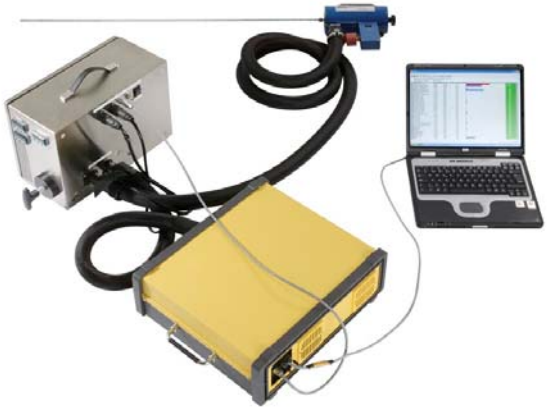
Stack testing

Stack testing

Portable **Gasmet**™ measuring system is an ideal tool for stack testing. Just a single analyzer can be used to measure almost all criteria pollutants - this saves a lot of time and effort, not to mention the fast setup time and simple operation procedure.

Some key benefits of the **Gasmet**™ portable measuring system include:

- Just one analyser to
  - carry up to the platform
  - operate
  - maintain
- Very low need for calibrations – no span calibrations needed
- All measurement data is stored on a computer, allowing full post-measurement processing of the data
- The same system can be used in many different applications, due to the expandability of the system



The **Gasmet**™ portable measuring system:

- **Gasmet**™ Dx-4000 gas analyzer
- **Gasmet**™ portable Sampling Unit
- Portable Sample Probe
- Sample Lines

All parts that are in contact with the sample gas are heated to 180°C.

Applications:

In typical stack testing application following components are continuously measured:

Component	*Formula*	*Typical Ranges*
Water vapour	H_2O	High %
Carbon dioxide	CO_2	High %
Carbon monoxide	CO	From low ppm to high %
Nitrogen monoxide	NO	From low ppm to high ppm
Nitrogen dioxide	NO_2	From low ppm to high ppm
Nitrous oxide	N_2O	Low ppm
Sulphur dioxide	SO_2	From low ppm to high ppm
Methane	CH_4	From low ppm to high ppm
Ammonia	NH_3	Low ppm
Hydrogen fluoride	HF	Low ppm
Hydrogen chloride	HCl	Low ppm

One of **Gasmet**'s outstanding advantages is the capability to measure several additional components, which can easily be added into the analysis settings. Some typical examples:

Group	*Examples*	*Application area*
Hydrocarbons	Methane, Ethane, Acetylene	Combustion efficiency in natural gas fueled incinerators
BTEX	Benzene, Toluene, Ethylbenzene, m-,o- and p-Xylene	Combustion and Pyrolysis processes
Aldehydes	Formaldehyde	Incinerators, Cement industry
Non-organic compounds	Ozone	Pulp and paper industry
	Chlorine dioxide	Pulp and paper industry
	Hydrogen cyanide (HCN)	Waste incineration