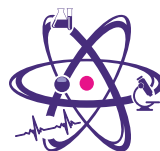


Multiplelabs
Turnkey Laboratories Solutions

FTIR-9400

Gas Analyser





On-site Series includes portable multicomponent gas analyzers for demanding applications. The FTIR-9400 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 FTIR-9400 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 FTIR-9400 allows simple calibration using only single component calibration gases. The user can easily configure the analyzer for a new set of compounds.

►► General parameters

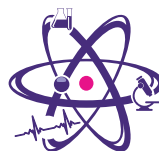
Measuring principle	Fourier transform infrared, FTIR
Performance	Simultaneous analysis of up to 50 gas compounds
Operating temperature	Short term 0 - 40 °C long term 5 - 30 °C non-condensing
Response time, T ₉₀	Typically < 120 s, depending on the gas flow and measurement time
Storage temperature	-20 - 60 °C, non-condensing
Power supply	100-115 or 230 V / 50 -60 Hz
Power consumption	Average 150 W, maximum 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
Wave number range	900 - 4 200 cm ⁻¹

►► Sample cell

Structure	Multi-pass, fixed path length 5.0 m
Material	100 % rhodium coated aluminum
Mirrors	Fixed, protected gold coating
Volume	0.4 liters
Connectors	Inlet Swagelok 6 mm, Outlet Swagelok 8 mm



Gaskets	Viton ® O-rings
Temperature	180 °C, maximum
Window material	BaF2

▶▶ Measuring parameters

Zero-point calibration	24 hours, calibration with nitrogen (5.0 or higher N2 recommended)
Zero-point drift	< 2 % of measuring range per
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.
Power connection	Standard plug CEE-22
PSS connection	Remote connection of PSS (Portable Sampling System)

▶▶ Gas inlet and outlet conditions

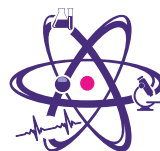
Gas temperature	Non-condensing, the sample gas temperature should be the same as the sample cell temperature
Flow rate	120 - 600 liters per hour
Gas filtration	Filtration of particulates (2 µm) required
Sample gas pressure	Ambient
Sample pump	External, not included

▶▶ Electronics

A/D converter	Dynamic range 95 dB
Signal processor	32-bit floating point DSP 120 MFLOPS
Computer	External, not included

▶▶ Analysis software (for external PC)

Operating system	Windows 7 or Windows 10
Analysis software	Calcmets for Windows



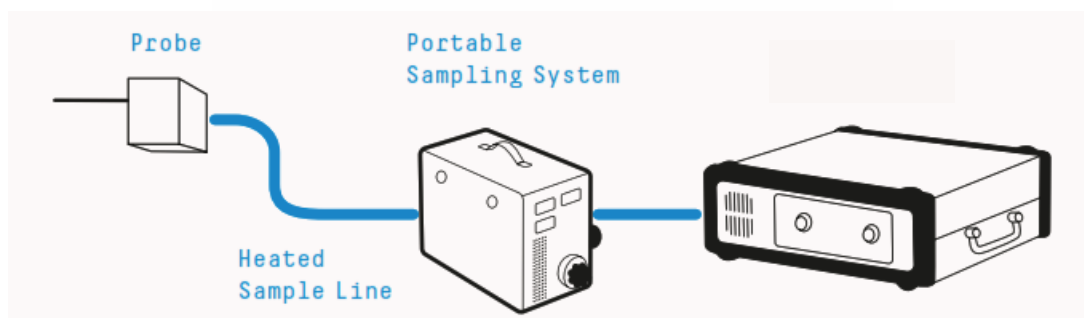
►► Options

Sample cell	Multi-pass, fixed path length 2.5 m or 9.8m
Pressure measurement	Inside sample cell
Analog signals (ext. PC)	TCP module (for analog inputs, outputs, relays)
Sample cell gaskets	Kalrez [®]
Trolley	Wheeled cart for the analyzer and laptop computer

►► Enclosure

Material	Aluminum
Dimensions (mm)	390 * 445 * 164
Weight	13.9 kg
CE label	According to EMI guideline 89/336/EC

- FTIR Gas Analyzer is the most powerful tool available for emissions monitoring, process gas analysis and compliance testing.



►► What is the FTIR-9400 ?

A portable multicomponent FTIR analyzer that is designed for monitoring gas concentrations in hot, wet and corrosive gas streams. Together with the Portable Sampling System (PSS) it forms a complete portable FTIR emissions monitoring system offering the same top of the class performance fixed systems in an easily transportable package.

The entire sampling train of PSS is heated to 180 °C and allows direct sampling of hot and wet sample gas without need for preconditioning of the sample. This allows for easy operation of the system and accurate results, as no analyte (sample) gases will be lost in conditioning of the sample.

The compact and modular design of the system allows the analyzer to be easily transported and quickly assembled, allowing for fast mobilisation and less wasted time waiting to conduct the analysis.

The system is operated by the powerful yet easy to use software on a PC computer. The Calcmet software offers all the tools needed for challenging measurement campaigns.

Fourier Transform Infrared (FTIR) spectroscopy, which is a powerful gas measurement technology. FTIR spectroscopy works by scanning and analyzing the entire infrared spectrum in order to measure all the infrared absorbing gases in the sample simultaneously. Most molecules have a characteristic absorption spectrum that can be used to identify gases and accurately measure their concentration.

►► What is it used for?

Due to the flexibility of FTIR technology can be used in a wide variety of applications, ranging from research applications to process measurements and emissions monitoring. Typical uses include:

Stack testing: QAL2 tests for HCl, NH₃, SO₂, NO_x and other gases

Scrubber and catalyst efficiency tests

Combustion and engine R&D

PFC emissions at Aluminum and Semiconductor plants

Carbon capture and sequestration

Formaldehyde emissions from biogas

►► Why buy the FTIR-9400?

- > Portable
- > Easy assembly on-site
- > Addition of new gases & ranges without hardware changes
- > No sample pre-conditioning
- > Online results
- > Simultaneous measurement of all gases

►► Which gases can be measured?

The FTIR-9400 can be used to measure up to 50 different gases. In combustion processes the is typically used to simultaneously measure:

Typically measured gases

Water, H ₂ O	Hydrogen Fluoride, HF
Carbon Dioxide, CO ₂	Ammonia, NH ₃
Carbon Monoxide, CO	Methane, CH ₄
Nitrous Oxide, N ₂ O	Ethane, C ₂ H ₆
Nitric Oxide, NO	Propane, C ₃ H ₈
Nitrogen Dioxide, NO ₂	Ethylene, C ₂ H ₄
Sulfur Dioxide, SO ₂	Formaldehyde, CH ₂ O
Hydrogen Chloride, HCl	Oxygen, O ₂

The FTIR-9400 is one of the most powerful tools available for challenging gas measurements. The amount of measurable gases is unparalleled and the system is easily configurable to measure new compounds without need for hardware changes.

Please contact your local representative for more available compounds, ranges and more information.