600
SERIES

# FTIR

## Fourier Transform Infrared Analyzer
## Product Spec Sheet

### APPLICATIONS

- Process Control
- Stack Gases (CEM / MACT)
- VOC Abatement/Scrubber Efficiency
- Fermentation Monitoring
- Vehicle Emissions
- Ammonia Slip
- Gas Purity
- Monitoring of Agricultural Emissions
- Biomass Emissions
- Greenhouse Gas
- Landfill Gas

### OPTIONS

- Analog Output Module
- Intelligent Multipoint Sampler
- Sample Accessories
- System Integration with HFID and Oxygen

### FEATURES

- Low Cost of Acquisition and Operation
- Proven, Rugged Interferometer With Gold Mirrors
- Multi-Gas Capability
- No Liquid Nitrogen Required
- Pressure Compensation Resolution of 0.9 $CM^{-1}$
- Heated Sample Cell (50° to 191° C)
- Minimal Sensitivity to Vibration
- Laptop Controlled with Opus Spectroscopy Software
- On-board Self Diagnostics
- Compact Size
- Light Weight


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600 SERIES

# Fourier Transform Infrared (FTIR) Analyzer Product Spec Sheet

## DESCRIPTION

The California Analytical Instruments Series 600 FTIR provides fast, continuous and stable analysis of virtually any gas which has an infrared absorption spectrum. The proprietary heated sample cell allows the instrument to accommodate hot samples containing high levels of moisture. The 600 Series FTIR can serve a variety of applications including diesel emissions, CEM monitoring, ammonia slip, greenhouse gas, SCR inlet/outlet monitoring, process monitoring and others.

Unlike other FTIR Analyzers, the 600 Series FTIR does not require liquid nitrogen thus eliminating the need to constantly fill LN2 dewars with associated safety issues. Its small footprint and light weight allows easy installation and transportability when required.

## METHOD OF OPERATION – FTIR

The 600 Series FTIR is based on Fourier Transform Infrared Spectroscopy. Nonsymmetrical gas phase molecules absorb IR light which in turn causes the molecular bonds to stretch, bend, or rotate. This absorption is used to measure and quantify several chemical components simultaneously.

An IR source emits radiation in the range of 7500 to 375 $cm^{-1}$. The IR radiation is split in a Michelson interferometer where half of the light passes through to a fixed mirror and the other half is reflected towards a moving mirror. The two beams recombine and pass through a 4.3 meter multi-reflection gas cell where the sample absorbs light at molecule specific frequencies. The remaining light is measured with a DTGS detector and Fourier transformed to convert from time domain to frequency domain producing a single beam spectrum which is ratioed with a baseline spectrum and produces and absorbance spectrum. This absorbance spectrum is quantified with chemometrics to produce a concentration value.

## OPUS SOFTWARE PACKAGE

The 600 Series FTIR OPUS software offers easy-to-use features such as spectrum calculator, absorbance-to-transmission conversion, automatic baseline correction, and peak picking. It allows multiple spectra to be manipulated at the same time. The OPUS package consists of several components: OPUS/SEARCH allows identification of unknown compounds by searching a database of known spectra, OPUS/QUANT is a chemometric package for setting up sophisticated methods for quantitative analysis (Partial Lease Squares), OPUS/IDENT uses hierarchical libraries for identification of samples, and OPUS/PROCESS which is based on a standardized OPC interface and allows combination of measurement protocols and analytical methods.

## GASES AVAILABLE

- Acetylene
- Ammonia
- Carbon Dioxide
- Carbon Monoxide
- Chloroform
- Dichloroethylene
- Ethane
- Ethanol
- Ethyl Benzene
- Formaldehyde
- Methane Toluene
- Methyl Ethyl Ketone
- Nitrous Oxide
- Nitric Oxide
- Nitrogen Dioxide
- Perchloroethylene
- Phosgene
- Propane
- Propylene
- R 134A
- Sulfur Hexafluroide
- Sulfur Dioxide
- Vinyl Chloride

Contact CAI for other gases available.

## SPECIFICATIONS

**Analysis Method:** Fourier Transform Infrared (FTIR)
**Components:** Multiple Gases
**Interferometer:** RocksolidTM, Permanent Alignment, High Stability with Cube Corner Reflectors and Non-wearing Bearing for Long Life
**Detector Type:** Air Cooled—DTGS
**Ranges:** From ppb to percent
**Response Time:** Dependent Upon Scan Speed and Number of Components
**Spectral Resolution:** Better than 0.9 $cm^{-1}$
**Spectral Range:** 305-7500 $cm^{-1}$
**Scan Speed:** 1-300 Seconds
**Outputs Available:** TCP/IP, Optional Analog Output
**Control:** PC, Windows XP
**Ambient Temperature:** 18° to 35° C
**Ambient Humidity:** Less than 80% RH (Non-condensing)
**Purge Fitting:** ¼ inch Swaglock
**Power Requirements:** 115/230 (+/- 10%) VAC; 50/60Hz,
**Dimensions:** 7"H x 19"W x 24"D (without fittings/vibration isolators)
**Weight:** Approximately 65-70 lbs.

## GAS CELL

**Construction:** 316 Stainless Steel (50°C to 191°C)
**Volume:** 800 cc
**Effective Pathlength:** 4.3 Meters
**Mirrors:** $MgF_2$ Coated ZnSe Gold Plated SS Mirrors
**Windows:** Humidity Protected KBr
**O-rings:** Parafluor
**Inlet/Outlet Connections:** 1/2" Tubing