Spectrum
ENVIRONMENTAL SOLUTIONS

WaveRunIR™-CPM

The Future of FTIR-based Continuous Process Monitoring Instruments

Spectrum's WaveRunIR™CPM is uniquely designed for real-time semiconductor fabrication tool monitoring, POU abatement control, and process reactor chamber in-line monitoring and optimization. Spectrum's WaveRunIR-CPM specializes in the monitoring of total acids, polyfluorinated compounds (PFCs) certain volatile organic compounds (VOC's), and catalytic combustion gases.

A high performance and compact FTIR spectrometer integrated with a gas sampling and data analysis/streaming automation platform allows for complete on-line process monitoring.

Using a permanently aligned interferometer and a solid-state reference laser, as well as a specialized proprietary chemometrics package, the Spectrum WaveRunIR-CPM offers excellent stability in spectral intensity/wavelength scales with virtually no baseline drift and enhanced analytical method resolution amongst target analytes. The WaveRunIR family of devices is adaptable, with multiple configurations, for indoor air quality and airborne molecular contamination monitoring.

Configurations

- Lightweight with a small footprint
- Can be directly mounted to the process vent/duct
- Can be customized to look at different analytes as a function of location opposed to a set of analytes at all locations

Industries Served

- Refining
- Chemical/Petrochemical
- Semiconductor
- Manufacturing

Applications

- Failure/Composition of Catalyst Materials
- Industrial Worker Exposure Monitoring
- In-Duct Component Concentration Monitoring
- Real-time Concentrations of Control/Abatement Devices

Providing customized technology solutions for your most complex air quality problems.

Key Features

About WaveRunIR™-CPM

- Multivariate quantitative analysis of analytes simultaneously with NIST-traceable calibrations
- Sub-ppmv sensitivity of analytes without need of liquid nitrogen (via multi-stage TE-cooled MCT detector).
- Proprietary spectral chemometrics and data preprocessing lead to virtually no spectral baseline drift and full resolution of overlapped absorbances.
- Excellent stability in intensity and wavelength against external vibration and atmospheric affects, using inert/heated gas sampling components.
- Real-time (<2 min avg.) quantification data streaming to local SCADA, including sample duct flow measurement, plus 4-20mA, 0-10 DCV, dry contact alarm signaling. Other options available.

Models	CPM-FA	CPM-PFC
Base target gas analytes[I]	HCOOH monomer, HCOOH dimer, CO, CO_2, H_2O, NO_X, Exhaust Duct Flow Rate	CF_4, CF_6, C_2F_6, C_3F_6, NF_3, CHF_3, HF, CO, CO_2, H_2O, NO_X, Exhaust Duct Flow Rate, Temp, Pressure
Nominal detection limits (ppmv)	<0.5 for Total HCOOH, <0.75 for combustion species	<0.3 for PFC's and HF, <1 for combustion species
Spectral range (um)	2-12	2-12
Detector type	MCT (4-TE cooled)	MCT (4-TE cooled)
Noise equivalent absorbance[II] (AU)	<0.0005	<0.0005
Sample cell window material	Barium fluoride	Barium flouride
Interferometer type	Permanently aligned, double retro-reflector design	
Resolution (cm^{-1})	4	
Wavenumber repeatability	<10PPM	
Interferometer Control Laser	Temperature-stabilized solid-state laser @850nm	
Frequency of quantitative data	Simultaneous multi-gas analysis per <2 min	
Quantitative measurement range	0-10,000 ppmv	
Quantitative measurement accuracy	< ±10%	
Quantitative measurement precision	< ±5%	
Sample cell temperature setting range	Ambient - 200°C	
Facility gas requirements	1 ccfm, <60 psig N_2 or CDA (for venturi sample pump)	
Gas tubing material, sample flow rate	PFA Teflon for sample and venturi pump feed/exhause, Sample flow rate ~4 lpm	
Gas connectors	1/4" swage for inlets (sample and venturi feed) 3/8" swage for outlet (venturi exhaust)	
Power Requirement	120 VAC, <5A, standard instrument device 3-prong cord	
Communication interfaces	Modbus TCP for data streaming to facility SCADA; 4-20 mA, 0-10 DCV, and/or dry contact alarms to process tools	
Software interface[III]	Compiled NuWave™ on embedded Linus mini	
Dimensions	36" x 24" x 16"	
Weight	35 lbs.	

WaveRunIR™-CPM

About Spectrum

From FTIR, RAMAN, UV-DOAS, and optical remote sensing instrumentation, to real-time measurements, software integration and complete environmental consulting, Spectrum Environmental Solutions is a leading full service environmental solutions provider.

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