



# Gas Analysis

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## AIRGARD® FTIR

### AMBIENT AIR ANALYZER FOR CONTINUOUS DETECTION OF HAZARDOUS PRODUCTION MATERIALS (HPM) AND TOXIC INDUSTRIAL CHEMICALS (TIC)

#### RAPID RESPONSE • VERY LOW DETECTION LIMITS • MULTIPLE GASES SIMULTANEOUSLY

The MKS AIRGARD ambient air analyzer is an ultra-sensitive, Fourier Transform Infrared Spectroscopy (FT-IR) based gas analyzer designed to rapidly detect toxic gases. The analyzer is capable of detecting parts per billion (ppb) levels of most HPMS and TICs below Threshold Limit Values (TLV) and/or Immediately Dangerous to Life or Health (IDLH) levels within 20 seconds.

The AIRGARD analyzer has been thoroughly tested by the Department of Defense for its sensitivity, specificity, response time, and immunity to false positive alarms caused by the sensing of, and alarming to, everyday benign, non-toxic solvents and industrial chemicals. This immunity to false alarms prevents unwarranted evacuation of buildings, associated interruptions of business and emergency notifications when no toxic materials are present.

#### Features & Benefits

- Single-digit ppb detection limits – ability to discriminate and alarm to a broad range of toxic materials.
- Rapid response – typical time to alarm and identify toxic gases < 20 seconds
- Monitor and individually speciate up to 50 gases simultaneously
- Flexibility to easily modify analysis method to add or remove gases
- Automated, stand-alone operation – self-contained analyzer with embedded computer and sampling pump
- Low cost of ownership – no annual consumable costs
- Large reference library – 375+ gases with customer gas additions available.

#### Applications

- Continuous detection of HPMS and TICs
- Airborne Molecular Contamination (AMC)
- Emergency Response (ERT) gas monitoring
- Ambient air, exhausted enclosures, abatement systems, gas delivery (gas cabinets and VMBs)
- Semiconductor, Solar, LED manufacturing
- Research laboratories – University, Government, Nanotech



# Specifications

## Measurement Technique

## Measurable Gases

## Ranges

## Fittings/Connections

## Tubing

## Installation

## Operating Dimensions

## Operating Weight

## Operating Temperature/Humidity

## Power

## FTIR Spectrometry

Nearly all organic and inorganic gases except diatomics and noble gases

( $H_2$ ,  $F_2$ ,  $Cl_2$ ,  $N_2$ ,  $O_2$ ,  $Br_2$ , He, Ne, Ar, Kr, Xe)

Concentration settings between 1ppb and 100% full scale

3/8" Swagelok®

1/4" Stainless steel and Tygon®

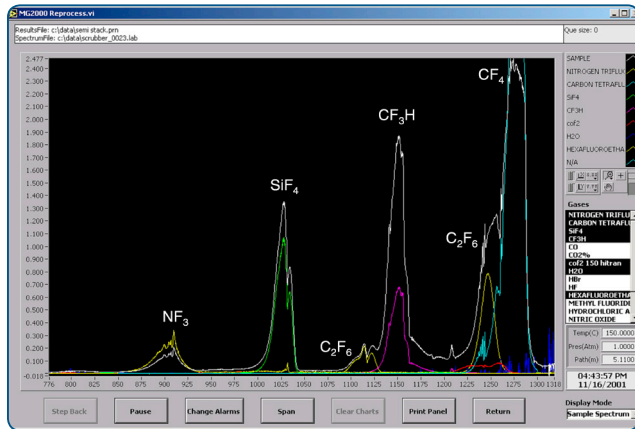
19" Wall mount chassis

18.4" (W) x 25.4" (H) x 7.5" (D) [46.7 x 64.5 x 19.1 (cm)]

75 lbs. [34.1kg]

10-40°C / up to 65% RH

120 or 240 VAC, 50/60Hz, 3 amps



## IR Spectrum of Semiconductor Stack —

The AIRGARD FTIR can speciate (differentiate) similar molecules simultaneously.



## Detection Limits

Example low-level detection limits for typical gases in the absence of interfering species:

Name	Formula	Detection Limit Ranges 10 sec. measurement*
Ammonia	NH <sub>3</sub>	7 – 35 ppb
Arsine	AsH <sub>3</sub>	5 – 25 ppb***
Benzene	C <sub>6</sub> H <sub>6</sub>	90 – 450 ppb
Boron Trichloride	BCl <sub>3</sub>	5 – 25 ppb
Boron Trifluoride	BF <sub>3</sub>	80 – 400 ppb**
Carbonyl Sulfide	COS	15 – 75 ppb
Diborane	B <sub>2</sub> H <sub>6</sub>	5 – 25 ppb
Dichlorosilane	SiH <sub>2</sub> Cl <sub>2</sub>	5 – 25 ppb
Germane	GeH <sub>4</sub>	5 – 25 ppb***
Hexafluoro-1,3 butadiene	C <sub>4</sub> F <sub>6</sub>	10 – 50 ppb
Hydrogen Bromide	HBr	65 – 325 ppb
Hydrogen Chloride	HCl	20 – 100 ppb
Hydrogen Fluoride	HF	12 – 60 ppb
Nitric Oxide	NO	5 – 25 ppb**
Nitrogen Fluoride	NF <sub>3</sub>	5 – 25 ppb
Octafluorocyclopentene	C <sub>5</sub> F <sub>8</sub>	5 – 25 ppb
Ozone	O <sub>3</sub>	12 – 60 ppb
PGMEA	C <sub>6</sub> H <sub>12</sub> O <sub>3</sub>	20 – 100 ppb
Phosphine	PH <sub>3</sub>	20 – 100 ppb***
Silane	SiH <sub>4</sub>	7 – 35 ppb
Silicon Tetrachloride	SiCl <sub>4</sub>	380 ppb – 2ppm
Silicon Tetrafluoride	SiF <sub>4</sub>	5 – 25 ppb
Tetraethoxysilane	TEOS	5 – 25 ppb
Toluene	C <sub>7</sub> H <sub>8</sub>	60 – 300 ppb
Trichlorosilane	SiHCl <sub>3</sub>	5 – 25 ppb
Tungsten Hexafluoride	WF <sub>6</sub>	8 – 40 ppb
o-Xylene	C <sub>8</sub> H <sub>10</sub>	20 – 100 ppb

\* Lowest detection limits will vary based on application specific anomalies in background air

\*\* Dependent on H<sub>2</sub>O levels in air

\*\*\* Dependent on spectral regions used for analysis



## Ordering Information

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Please contact your MKS Sales office for price and availability information.



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