Thermo Scientific Analysis Methods for the Antaris IGS Gas Analyzer

Complete Method and Calibration Tools for Precise Gas Monitoring

Combustion Gas
Gasoline – Raw Exhaust Method....2
Gasoline – Dilute Exhaust Method....3
Diesel – Raw Exhaust Method....3
Diesel – Dilute Exhaust Method....4
Simulated Exhaust
Catalyst – Simulated Exhaust Method....4
Air Bag Effluent Analysis
Air Bag 60 Liter Method....5
Air Bag 100 Cubic Foot Method Breathing Gas....5
Breathing Gas
Aviator's Breathing Oxygen Method....6
Compressed Breathing Air Method....6
Fire Science
Fire Science Method....7
Custom Calibration....7-8

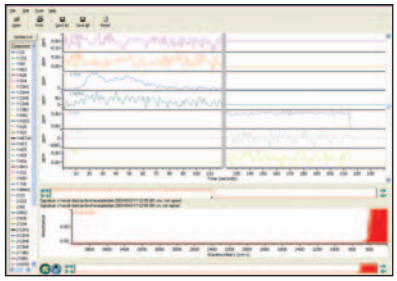
Thermo SCIENTIFIC

The Thermo Scientific Antaris IGS gas analyzer offers precise gas monitoring in a package developed for industrial environments. Featuring best-in-class speed, resolution, and support, its performance represents a new level of fit-for-purpose FT-IR gas analysis. And, as part of the complete Antaris™ IGS solution, many gas calibrations are available as packaged solutions to solve your problem quickly.

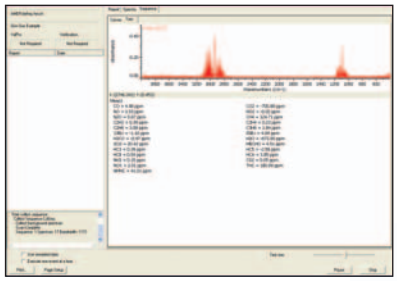
We offer several analysis method and calibration products that tailor the analyzer to your application. In addition to the analysis method, our applications support team can also calibrate your gas analyzer for your required concentration ranges.

- Raw combustion gas‡
- Diluted combustion gas‡
- Fire science
- Aviators breathing oxygen and compressed breathing air
- Air bag inflator effluent
- Bulk gas/Air separation
- EPA protocol gas calibration

‡ Combustion gas includes applications such as diesel-fueled engines, gasoline engines, alternative-fueled engines, clean coal and catalysis.



Thermo Scientific RESULT Data View interface



Operation run time gas analysis report

Contact your Thermo Scientific representative to find out how we can configure an Antaris IGS gas analyzer to meet your needs.

Combining the performance requirements of bench-top analysis with the dependability needed for online analysis, the Antaris IGS analyzer is the premier industrial FT-IR system for gas analysis. This system is the result of years of FT-IR experience and development partnerships within the industry, from the trusted leaders in FT-IR, Thermo Fisher Scientific.

Gasoline – Raw Exhaust Method and Calibration

The Gasoline – Raw Exhaust method is designed for spark-ignition engine combustion analysis where gasoline is the fuel. The raw exhaust method covers concentration ranges found in the exhaust gas without dilution. The combustion gas sample is taken either before or after the catalytic converter. This method is configured with the Thermo Scientific 2 meter gas cell and a liquid-nitrogen cooled MCT-A detector. Detection limits are based on a 3-second sample time.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetylene	Library spectrum	5 – 200 ppm	
Ammonia	Factory calibrated (10 – 1000 ppm)	5 – 500 ppm	
1,3-Butadiene	Library spectrum	5 – 200 ppm	
Carbon dioxide	Factory calibrated (50 ppm – 20%)	1000 ppm – 20%	
Carbon monoxide	Factory calibrated (3 ppm – 10%)	10 ppm – 10%	
Ethane	Library spectrum	5 – 200 ppm	
Ethylene	Library spectrum	5 – 200 ppm	
Ethanol	Library spectrum	5 – 1000 ppm	
Formaldehyde	Library spectrum	5 – 200 ppm	
Methane	Factory calibrated (5 ppm – 1%)	5 ppm – 1%	
2-Methylpropene (isobutylene)	Library spectrum	5 – 200 ppm	
MTBE, ETBE	Library spectrum	10 – 200 ppm	
Nitrogen dioxide	Factory calibrated (10 – 1000 ppm)	20 – 200 ppm	
Nitric oxide	Factory calibrated (1 ppm – 1%)	10 ppm – 1%	1
Nitrous oxide	Factory calibrated (5 – 50 ppm)	5 – 200 ppm	
NO_x	Combination of N_2O, NO and NO_2	10 ppm – 1%	
Propylene	Library spectrum	5 – 200 ppm	
THC	Library spectrum	5 – 1000 ppm	
Water	Factory calibrated (Room temp – 60°C)	2 – 26%	1

NOTES: 1. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as like NO.

Gasoline – Dilute Exhaust Method and Calibration

The Gasoline – Dilute Exhaust method is also designed for spark-ignition engine combustion analysis where gasoline is the fuel. The dilute exhaust method covers concentration ranges found in diluted exhaust gas typically sampled after a constant volume sampler. This method is configured with the Thermo Scientific 10 meter gas cell and a liquid-nitrogen cooled MCT-A detector. Detection limits are based on a 3-second sample time.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetylene	Library spectrum	1 – 100 ppm	
Ammonia	Factory calibrated (10 – 1000 ppm)	1 – 200 ppm	
1,3-Butadiene	Library spectrum	1 – 100 ppm	
Carbon dioxide	Factory calibrated (50 ppm – 20%)	0.1 – 3%	
Carbon monoxide	Factory calibrated (3 ppm – 10%)	1 ppm – 1%	
Ethane	Library spectrum	1 – 100 ppm	
Ethylene	Library spectrum	1 – 100 ppm	
Ethanol	Library spectrum	1 – 100 ppm	
Methane	Factory calibrated (5 ppm – 1%)	1 – 1000 ppm	
2-Methylpropene (isobutylene)	Library spectrum	1 – 100 ppm	
MTBE, ETBE	Library spectrum	4 – 100 ppm	
Nitrogen dioxide	Factory calibrated (10 – 1000 ppm)	5 – 100 ppm	
Nitric oxide	Factory calibrated (1 ppm – 1%)	1 – 1000 ppm	1
Nitrous oxide	Factory calibrated (5 – 50 ppm)	1 – 100 ppm	
NO_x	Combination of N_2O, NO and NO_2	1 – 1000 ppm	
Propylene	Library spectrum	1 – 100 ppm	
THC	Library spectrum	1 – 500 ppm	
Water	Factory calibrated (Room temp – 60°C)	1 – 3%	1

NOTES: 1. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as like NO.

Diesel – Raw Exhaust Method and Calibration

The Diesel – Raw Exhaust method is designed for compression-ignition engine combustion analysis where diesel is the fuel. The raw exhaust method covers concentration ranges found in the exhaust gas without dilution. The combustion gas sample is taken either before or after exhaust after-treatment. This method is configured with the 2 meter gas cell and a liquid-nitrogen cooled MCT-A detector. Detection limits are based on a 3-second sample time.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetaldehyde	Library spectrum	15 – 200 ppm	
Acetylene	Library spectrum	5 – 200 ppm	
Ammonia	Factory calibrated (10 – 1000 ppm)	5 – 500 ppm	
1,3-Butadiene	Library spectrum	5 – 200 ppm	
Carbon dioxide	Factory calibrated (50 ppm – 20%)	0.1 – 20%	
Carbon monoxide	Factory calibrated (3 ppm – 10%)	5 ppm – 10%	
Ethane	Library spectrum	5 – 200 ppm	
Ethylene	Library spectrum	5 – 200 ppm	
Formaldehyde	Library spectrum	5 – 200 ppm	
Methane	Factory calibrated (5 ppm – 1%)	5 – 200 ppm	
2-Methylpropene (isobutylene)	Library spectrum	5 – 200 ppm	
Nitrogen dioxide	Factory calibrated (10 – 1000 ppm)	20 – 200 ppm	
Nitric oxide	Factory calibrated (1 ppm – 1%)	5 – 200 ppm	1
Nitrous oxide	Factory calibrated (5 – 50 ppm)	5 – 1000 ppm	
NO_x	Combination of N_2O, NO and NO_2	10 – 1000 ppm	
Propylene	Library spectrum	5 – 200 ppm	
Sulfur dioxide	Factory calibrated (10 –100 ppm)	10 – 200 ppm	2
THC	Library spectrum	5 – 1000 ppm	
Water	Factory calibrated (Room temp – 60°C)	2 – 26%	1

NOTES: 1. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as like NO.

2. High level of SO_2 and H_2O requires corrosion-resistant cell.

Diesel – Dilute Exhaust Method and Calibration

The Diesel – Dilute Exhaust method is designed for compression-ignition engine combustion analysis where diesel is the fuel. The dilute exhaust method covers concentration ranges found in diluted exhaust gas typically sampled in a dilution tunnel. This method is configured with the 10 meter gas cell and a liquid-nitrogen cooled MCT-A detector. Detection limits are based on a 3-second sample time.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetaldehyde	Library spectrum	5 – 100 ppm	
Acetylene	Library spectrum	1 – 100 ppm	
Ammonia	Factory calibrated (10 – 1000 ppm)	1 – 200 ppm	
1,3-Butadiene	Library spectrum	1 – 100 ppm	
Carbon dioxide	Factory calibrated (50 ppm – 20%)	0.1 – 3%	
Carbon monoxide	Factory calibrated (3 ppm – 10%)	1 ppm – 1%	
Ethane	Library spectrum	1 – 100 ppm	
Ethylene	Library spectrum	1 – 100 ppm	
Ethanol	Library spectrum	1 – 100 ppm	
Formaldehyde	Library spectrum	1 – 100 ppm	
Methane	Factory calibrated (5 ppm – 1%)	1 – 1000 ppm	
2-Methylpropene (isobutylene)	Library spectrum	1 – 100 ppm	
MTBE, ETBE	Library spectrum	4 – 100 ppm	
Nitrogen dioxide	Factory calibrated (10 – 1000 ppm)	5 – 100 ppm	
Nitric oxide	Factory calibrated (1 ppm – 1%)	1 – 1000 ppm	1
Nitrous oxide	Factory calibrated (5 – 50 ppm)	1 – 100 ppm	
NO_x	Combination of N_2O, NO and NO_2	1 – 1000 ppm	
Propylene	Library spectrum	1 – 100 ppm	
Sulfur dioxide	Factory calibrated (10 –100 ppm)	5 – 100 ppm	2
THC	Library spectrum	1 – 500 ppm	
Water	Factory calibrated (Room temp – 60°C)	1 – 3%	1

NOTES: 1. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as like NO.

2. High level of SO_2 and H_2O requires corrosion-resistant cell.

Catalyst – Simulated Exhaust Method and Calibration

The Catalyst – Simulated Exhaust method is designed for analyzing the performance of research or in-use catalysts in a laboratory environment. This method is configured with the 2 meter gas cell and a liquid-nitrogen cooled MCT-A detector. Detection limits are based on a 3-second sample time.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetylene	Library spectrum	5 – 200 ppm	
Ammonia	Factory calibrated (10 – 1000 ppm)	5 – 500 ppm	
1,3-Butadiene	Library spectrum	5 – 200 ppm	
Carbon dioxide	Factory calibrated (50 ppm – 20%)	0.1 – 20%	
Carbon monoxide	Factory calibrated (3 ppm – 10%)	5 ppm – 10%	
Ethane	Library spectrum	5 – 200 ppm	
Ethylene	Library spectrum	5 – 200 ppm	
Formaldehyde	Library spectrum	5 – 200 ppm	
Hydrogen cyanide	Library spectrum	5 – 200 ppm	1
Methane	Factory calibrated (5 ppm – 1%)	5 – 200 ppm	
2-Methylpropene (isobutylene)	Library spectrum	5 – 200 ppm	
Nitrogen dioxide	Factory calibrated (10 – 1000 ppm)	20 – 200 ppm	
Nitric oxide	Factory calibrated (1 ppm – 1%)	5 – 200 ppm	1
Nitrous oxide	Factory calibrated (5 – 50 ppm)	5 – 1000 ppm	
NO_x	Combination of N_2O, NO and NO_2	10 – 1000 ppm	
Propane	Library spectrum	5 – 1000 ppm	
Propylene	Library spectrum	5 – 1000 ppm	
Sulfur dioxide	Factory calibrated (10 –100 ppm)	5 – 200 ppm	2
Water	Factory calibrated (Room temp – 60°C)	2 – 26%	1

NOTES: 1. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as like NO.

2. High level of SO_2 and H_2O requires corrosion-resistant cell.

Air Bag 60 Liter Method and Calibration

The Air Bag 60 liter method analyzes the effluent from air bag inflators tested in 60 liter devices. Detection limits assume a collection time of 2 minutes with a room-temperature DTGS detector.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetylene	Library spectrum	1 – 100 ppm	
Ammonia	Factory calibrated (10 – 1000 ppm)	1 – 500 ppm	
Benzene	Library spectrum	15 – 100 ppm	
Carbon dioxide	Factory calibrated (50 ppm – 20%)	300 ppm – 5%	
Carbon monoxide	Factory calibrated (3 ppm – 10%)	1 ppm – 1%	
Ethane	Library spectrum	1 – 100 ppm	
Ethylene	Library spectrum	1 – 100 ppm	
Formaldehyde	Library spectrum	1 – 100 ppm	
Hydrogen chloride	Library spectrum	1 – 100 ppm	
Hydrogen cyanide	Library spectrum	1 – 100 ppm	
Methane	Factory calibrated (5 ppm – 1%)	1 – 200 ppm	
Nitric oxide	Factory calibrated (1 ppm – 1%)	1 – 200 ppm	
Nitrogen dioxide	Factory calibrated (10 – 1000 ppm)	5 – 200 ppm	
Phosgene	Library spectrum	1 – 50 ppm	
Sulfur dioxide	Factory calibrated (10 –100 ppm)	1 – 100 ppm	2
Water	Factory calibrated (Room temp – 60°C)	0.5 – 5%	1, 2

NOTES: 1. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as like NO.

2. High level of SO_2 and H_2O requires corrosion-resistant cell.

Air Bag 100 Cubic Foot Method and Calibration

The Air Bag 100 cubic foot method is configured to analyze the effluent from air bag inflators tested in 100 cubic foot chambers. The 10 meter gas cell is used for this application. Detection limits assume a collection time of 2 minutes with a room-temperature DTGS detector.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetylene	Library spectrum	1 – 100 ppm	
Ammonia	Factory calibrated (10 – 1000 ppm)	1 – 500 ppm	
Benzene	Library spectrum	15 – 100 ppm	
Carbon dioxide	Factory calibrated (50 ppm – 20%)	300 ppm – 5%	
Carbon monoxide	Factory calibrated (3 ppm – 10%)	1 ppm – 1%	
Ethane	Library spectrum	1 – 100 ppm	
Ethylene	Library spectrum	1 – 100 ppm	
Formaldehyde	Library spectrum	1 – 100 ppm	
Hydrogen chloride	Library spectrum	1 – 100 ppm	
Hydrogen cyanide	Library spectrum	1 – 100 ppm	
Methane	Factory calibrated (5 ppm – 1%)	1 – 200 ppm	
Nitric oxide	Factory calibrated (1 ppm – 1%)	1 – 200 ppm	
Nitrogen dioxide	Factory calibrated (10 – 1000 ppm)	5 – 200 ppm	
Phosgene	Library spectrum	1 – 50 ppm	
Sulfur dioxide	Factory calibrated (10 –100 ppm)	1 – 100 ppm	2
Water	Factory calibrated (Room temp – 60°C)	0.5 – 5%	

NOTES: 2. High level of SO_2 and H_2O requires corrosion-resistant cell.

Aviator's Breathing Oxygen Method and Calibration

The Aviator's Breathing Oxygen (ABO) method is designed to detect impurities in ABO gas according to the US Air Force military standard 1564A. This method is used with the 10 meter gas cell. Detection limits assume a collection time of 2 minutes with a room-temperature DTGS detector.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetylene	One point calibration from a cylinder	0.5 – 10 ppm	
Carbon dioxide	One point calibration from a cylinder	1 – 20 ppm	
Carbon monoxide	One point calibration from a cylinder	0.1 – 10 ppm	
CFC 11	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 113	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 12	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 13	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 141b	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 22	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 225	One point calibration from a cylinder	0.5 – 10 ppm	
Ethane	One point calibration from a cylinder	0.5 – 10 ppm	
Ethylene	One point calibration from a cylinder	0.5 – 20 ppm	
Methane	One point calibration from a cylinder	0.5 – 50 ppm	
Nitrous oxide	One point calibration from a cylinder	0.5 – 10 ppm	
Propane	One point calibration from a cylinder	0.5 – 10 ppm	
Propylene	One point calibration from a cylinder	0.5 – 10 ppm	
Sulfur hexafluoride	One point calibration from a cylinder	0.5 – 10 ppm	
1,1,1-Trichloroethane	One point calibration from a cylinder	0.5 – 10 ppm	
Trichloroethylene	One point calibration from a cylinder	0.5 – 10 ppm	
Water	Factory calibrated (Room temp – 60°C)	5 – 100 ppm	1

NOTES: 1. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as like NO.

Compressed Breathing Air Method and Calibration

The Compressed Breathing Air (CBA) method analyzes CBA for impurities. This method is used with the 10 meter gas cell. Detection limits assume a collection time of 2 minutes with a room-temperature DTGS detector.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetylene	One point calibration from a cylinder	0.5 – 10 ppm	
Carbon dioxide	One point calibration from a cylinder	1 – 1000 ppm	
Carbon monoxide	One point calibration from a cylinder	0.1 – 10 ppm	
CFC 11	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 113	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 12	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 13	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 141b	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 22	One point calibration from a cylinder	0.5 – 10 ppm	
CFC 225	One point calibration from a cylinder	0.5 – 10 ppm	
Ethane	One point calibration from a cylinder	0.5 – 20 ppm	
Ethylene	One point calibration from a cylinder	0.5 – 10 ppm	
Methane	One point calibration from a cylinder	0.5 – 10 ppm	
Nitrous oxide	One point calibration from a cylinder	0.5 – 10 ppm	
Sulfur hexafluoride	One point calibration from a cylinder	0.5 – 10 ppm	
1,1,1-Trichloroethane	One point calibration from a cylinder	0.5 – 10 ppm	
Trichloroethylene	One point calibration from a cylinder	0.5 – 10 ppm	
Water	Factory calibrated (Room temp – 60°C)	5 – 100 ppm	1

NOTES: 1. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as like NO.

Fire Science Method and Calibration

The Fire Science method is configured to analyze toxic gases in the combustion of building materials. The method can be used with cone calorimeters, smoke boxes, or ambient sampling of combustion experiments. A corrosive-duty stainless-steel gas cell, such as the 2 meter or 10 meter gas cell, is recommended for this analysis. The 2 meter cell is recommended in all applications where the sample concentration is greater than 2 ppm; the 10 meter cell is recommended when analyzing samples below 2 ppm. Detection limits are based on a 3-second sample time with a liquid-nitrogen cooled MCT-A detector.

	TYPE OF CALIBRATION	CALIBRATION RANGE	NOTES
Acetaldehyde	Library spectrum	10 – 500 ppm	1
Acrolein	Library spectrum	10 – 200 ppm	1
Ammonia	Factory calibrated (10 – 1000 ppm)	5 – 500 ppm	
Carbon dioxide	Factory calibrated (50 ppm – 20%)	0.1 – 20%	
Carbon monoxide	Factory calibrated (3 ppm – 10%)	5 ppm – 10%	
Ethylene	Library spectrum	5 – 1000 ppm	1
Formaldehyde	Library spectrum	5 – 500 ppm	1
Hydrogen bromide	Library spectrum	5 – 1000 ppm	1, 2
Hydrogen chloride	Library spectrum	5 – 1000 ppm	1, 2
Hydrogen cyanide	Library spectrum	5 – 500 ppm	1, 2
Hydrogen fluoride	Library spectrum	5 – 1000 ppm	1, 2
Methane	Factory calibrated (5 ppm – 1%)	5 – 1000 ppm	
Nitric oxide	Factory calibrated (1 ppm – 1%)	5 – 200 ppm	2
Nitrogen dioxide	Factory calibrated (10 – 1000 ppm)	20 – 200 ppm	
NO_x	Combination of N_2O, NO and NO_2	10 – 1000 ppm	
Propylene	Library spectrum	5 – 200 ppm	1
Sulfur dioxide	Factory calibrated (10 –100 ppm)	5 – 200 ppm	3
Water	Factory calibrated (Room temp – 60°C)	2 – 26%	2

NOTES: 1. If there is a special needs gas, then it may be ordered and run as a custom gas. Otherwise many of the spectra of many of these gases are taken from the library.

2. Use ZnSe if greater than 3% water. Do not use ZnSe if more than a few hundred ppm of halogens (e.g.: HF, HCl, HBr) or % level acidic gases, such as NO. Use BaF_2 for halogen concentrations over a few hundred ppm.

3. High level of SO_2 and H_2O requires corrosion-resistant cell.

Custom Method and Calibration

We offer several analysis methods and calibration products, which tailor the Antaris IGS gas analyzer to your application. In addition to an analysis method, our applications team can also calibrate your analyzer for your required concentration ranges.

	CALIBRATION OPTIONS	SUITABLE WINDOW MATERIAL
Acetaldehyde	May be run at Thermo Fisher Scientific	KBr, ZnSe
Acetone	Must be run at customer site	KBr, ZnSe
Acetylene	May be run at Thermo Fisher Scientific	KBr, ZnSe
Acrolein	May be run at Thermo Fisher Scientific	KBr, ZnSe
Ammonia	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (10–1000 ppm)	KBr, ZnSe
Arsine	Must be run at customer site	KBr, ZnSe
Benzene	Must be run at customer site	KBr, ZnSe
Boron trichloride	Must be run at customer site	BaF_2
Boron trifluoride	Must be run at customer site	BaF_2
Bromomethane	Must be run at customer site	BaF_2
1,3-Butadiene	Must be run at customer site	KBr, ZnSe
Butane	May be run at Thermo Fisher Scientific	KBr, ZnSe
n-Butanol	Must be run at customer site	ZnSe, BaF_2
Carbon dioxide	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (50 ppm – 20%)	KBr, ZnSe
Carbon monoxide	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (3 ppm – 10%)	KBr, ZnSe
Carbon tetrachloride	Must be run at customer site	KBr, ZnSe
Carbonyl sulfide	Must be run at customer site	BaF_2
CFC 11	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
CFC 12	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
CFC 13	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2

NOTE: Calibration must be run at customer site if concentration is above Thermo Scientific limits or if specified. The customer must supply the standard gas or gases.

Table continued on back.

Table continued from previous page.

Custom Method and Calibration

	CALIBRATION OPTIONS	SUITABLE WINDOW MATERIAL
CFC 14	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
CFC 22	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
CFC 113	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
Chlorodifluoromethane	May be run at Thermo Fisher Scientific	BaF_2, ZnSe if low
Chloroethane	May be run at Thermo Fisher Scientific	BaF_2, ZnSe if low
Chlorotrifluoromethane	May be run at Thermo Fisher Scientific	BaF_2, ZnSe if low
Diborane	Must be run at customer site	BaF_2
1,2-Dibromoethane	Must be run at customer site	BaF_2, ZnSe if low
Dichlorodifluoromethane	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
Ethane	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
Ethanol	Must be run at customer site	ZnSe, BaF_2
Ethyl acetate	Must be run at customer site	KBr, ZnSe, BaF_2
Ethyl acrylate	Must be run at customer site	KBr, ZnSe, BaF_2
Ethylene	Must be run at customer site	KBr, ZnSe, BaF_2
Ethylene oxide	Must be run at customer site	KBr, ZnSe, BaF_2
Formaldehyde	Must be run at customer site	KBr, ZnSe, BaF_2
Formic acid	Must be run at customer site	ZnSe, BaF_2
Furan	Must be run at customer site	KBr, ZnSe, BaF_2
n-Hexane	Must be run at customer site	KBr, ZnSe, BaF_2
Hydrogen bromide	Must be run at customer site	ZnSe if low, BaF_2 if high
Hydrogen chloride	Must be run at customer site	ZnSe if low, BaF_2 if high
Hydrogen cyanide	Must be run at customer site	ZnSe BaF_2
Hydrogen fluoride	Must be run at customer site	ZnSe BaF_2
Hydrogen sulfide	Must be run at customer site	ZnSe BaF_2
Isobutanol	Must be run at customer site	ZnSe BaF_2
Isobutylene	Must be run at customer site	KBr, ZnSe
Isopropanol	Must be run at customer site	ZnSe, BaF_2
Methane	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (5 ppm–1%)	KBr, ZnSe, BaF_2
Methanol	Must be run at customer site	ZnSe, BaF_2
Methyl acrylate	Must be run at customer site	KBr, ZnSe, BaF_2
Methyl amine	Must be run at customer site	KBr, ZnSe, BaF_2
Methyl ethyl ketone	Must be run at customer site	KBr, ZnSe, BaF_2
Methyl isobutyl ketone	Must be run at customer site	KBr, ZnSe, BaF_2
Methyl nitrite	Must be run at customer site	KBr, ZnSe, BaF_2
Nitric acid	Must be run at customer site	ZnSe, BaF_2
Nitric oxide	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (1 ppm–1%)	ZnSe or BaF_2, KBr if low
Nitrogen dioxide	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (10–1000 ppm)	KBr, ZnSe, BaF_2
Nitrogen trifluoride	Must be run at customer site	ZnSe if low , BaF_2 if high
Nitrous acid	Must be run at customer site	ZnSe, BaF_2
Nitrous oxide	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (5 – 50 ppm)	KBr, ZnSe, BaF_2
n-Pentane	Must be run at customer site	KBr, ZnSe, BaF_2
Phosgene	Must be run at customer site	ZnSe if low, no water, BaF_2 if high
Phosphine	Must be run at customer site	BaF_2
Propane	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
Styrene	Must be run at customer site	KBr, ZnSe, BaF_2
Sulfur dioxide	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (10–100 ppm)	ZnSe or BaF_2
Sulfur hexafluoride	May be run at Thermo Fisher Scientific	KBr, ZnSe, BaF_2
Silane	Must be run at customer site	BaF_2
Silicon tetrachloride	Must be run at customer site	BaF_2
Toluene	Must be run at customer site	KBr, ZnSe
Trichloroethylene	Must be run at customer site	KBr, ZnSe
Vinyl bromide	Must be run at customer site	ZnSe if low, BaF_2 if high
Vinyl chloride	Must be run at customer site	ZnSe if low, BaF_2 if high
Water	May be run at Thermo Fisher Scientific or use standard Thermo Scientific calibration (Room temp – 60°C)	ZnSe if > 3% water, KBr if < 3% water non-condensing BaF_2
m-Xylene	Must be run at customer site	KBr, ZnSe, BaF_2
o-Xylene	Must be run at customer site	KBr, ZnSe, BaF_2
p-Xylene	Must be run at customer site	KBr, ZnSe, BaF_2

NOTE: Calibration must be run at customer site if concentration is above Thermo Scientific limits or if specified. The customer must supply the standard gas or gases.

In addition to these offices, Thermo Fisher Scientific maintains a network of representative organizations throughout the world.

Africa-Other
+27 11 570 1840 • analyze.sa@thermo.com
Australia
+61 2 8844 9500 • analyze.au@thermo.com
Austria
+43 1 333 50 34 0 • analyze.at@thermo.com
Belgium
+32 2 482 30 30 • analyze.be@thermo.com
Canada
+1 800 530 8447 • analyze.ca@thermo.com
China
+86 10 8419 3588 • analyze.cn@thermo.com
Denmark
+45 70 23 62 60 • analyze.dk@thermo.com
Europe-Other
+43 1 333 50 34 0 • analyze.emea@thermo.com
Finland / Norway / Sweden
+46 8 556 468 00 • analyze.se@thermo.com
France
+33 1 60 92 48 00 • analyze.fr@thermo.com
Germany
+49 6103 408 1014 • analyze.de@thermo.com
India
+91 22 6742 9434 • analyze.in@thermo.com
Italy
+39 02 950 591 • analyze.it@thermo.com
Japan
+81 45 453 9100 • analyze.jp@thermo.com
Latin America
+1 608 276 5659 • analyze.la@thermo.com
Middle East
+43 1 333 50 34 0 • analyze.emea@thermo.com
Netherlands
+31 76 579 55 55 • analyze.nl@thermo.com
South Africa
+27 11 570 1840 • analyze.sa@thermo.com
Spain
+34 914 845 965 • analyze.es@thermo.com
Switzerland
+41 61 716 77 00 • analyze.ch@thermo.com
UK
+44 1442 233555 • analyze.uk@thermo.com
USA
+1 800 532 4752 • analyze.us@thermo.com

www.thermo.com

Thermo Electron Scientific Instruments LLC, Madison, WI USA is ISO Certified.

CT50559_E 12/09M

Thermo SCIENTIFIC