MIDAS®-M
PHOSPHINE (PH_3)_LOW CROSS SENSITIVITY

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	PHOSPHINE (PH_3)
Cartridge Part Number	MMS-R2
Sensor Technology	3 electrode electrochemical cell
Measuring Range	PH3 0 - 1200ppb
Default Alarm 1	150 ppb (rising)
Default Alarm 2	300 ppb (rising)
Accuracy	< ± 5% of measured value Exposure to PH_3 600ppb for 5 minutes
Response Time ($t_{62.5}$)	Typical 6 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 1 ppb / °C < ± 0.6% of measured value / °C
Operating Humidity (continuous)	10 - 90% rH
Effect of Humidity Zero Sensitivity	 < ± 0.5 ppb / %rH < ± 0.5 % of measured value / %rH
Operating Pressure	90 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < ± 5% of measured value / 6 month
Calibration Gas	Phosphine (300 - 900ppb, default 600ppb)
Challenge Gas (Bump Test)	Phosphine (PH_3 600ppb)
Warm Up Time	< 20 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

NOTE: The PH_3 sensor should not be used with H_2S sensor in same Midas-M unit

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Midas®-M Phosphine (PH_3)_low cross sensitivity Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppb PH_3)
Ammonia	NH_3	50	< 380
Arsine	AsH_3	0.15	120
Carbon Dioxide	CO_2	5000	0
Carbon Monoxide	CO	85	0
Chlorine	Cl_2	0.85	< -50
Diborane	B_2H_6	0.2	10
Hydrocarbons	CH_4	18000	0
Hydrogen	H_2	3100	< 50
Hydrogen Chloride	HCl	7.9	0
Hydrogen Cyanide	HCN	12.6	300
Hydrogen Fluoride	HF	7.2	0
Hydrogen Selenide	SeH_2	0.85	0
Hydrogen Sulphide	H_2S	18.2	0
Nitrogen Dioxide	NO_2	10.1	-1600
Propan-2-ol	C_3H_7OH	20000	< 50
Silane	SiH_4	10	1200 (Overrange)
Sulphur Dioxide	SO_2	17.8	0

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Manuals and other information about this product are available at:
www.honeywellanalytics.com/en/products/Midas-M

HIS_GAS_Midas_Phosphine (PH3)_low cross sensitivity_DTS_EN_1219

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MIDAS®-M NITROGEN DIOXIDE (NO_2)

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	NITROGEN DIOXIDE (NO_2)
Cartridge Part Number	MMS-VN
Sensor Technology	3 electrode electrochemical cell
Measuring Range	NO_2 0 - 12ppm
Default Alarm 1	1.5 ppm (rising)
Default Alarm 2	3.0 ppm (rising)
Accuracy	< ± 10% of measured value Exposure to NO_2 6ppm for 5 minutes
Response Time ($t_{62.5}$)	Typical 15 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 0.01 ppm / °C < ± 0.7% of measured value / °C
Operating Humidity (continuous)	10 - 90% rH
Effect of Humidity Zero Sensitivity	 No effect < ± 0.5 % of measured value / %rH
Operating Pressure	90 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < 2% signal drift / month
Calibration Gas	Nitrogen Dioxide (3 - 9ppm, default 6ppm)
Challenge Gas (Bump Test)	Nitrogen Dioxide (NO_2 6ppm)
Warm Up Time	< 10 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

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Midas®-M Nitrogen Dioxide (NO_2) Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm NO_2)
Carbon Monoxide	CO	300	0
Hydrogen Sulfide	H_2S	20	-6
Sulfur Dioxide	SO_2	5	0
Nitric Oxide	NO	35	0
Chlorine	Cl_2	1	1
Iso Propanol	C_3H_7OH	1000	1.6

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HIS_GAS_Midas_Nitrogen Dioxide (NO2)_DTS_EN_1219

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MIDAS®-M
NITRIC OXIDE (NO)

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	NITRIC OXIDE (NO)
Cartridge Part Number	MMS-V2
Sensor Technology	3 electrode electrochemical cell
Measuring Range	NO 0 - 100ppm
Default Alarm 1	12.5 ppm (rising)
Default Alarm 2	25 ppm (rising)
Accuracy	< ± 10% of measured value Exposure to NO 50ppm for 5 minutes
Response Time ($t_{62.5}$)	Typical 15 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 0.17ppm / °C < ± 0.5% of measured value / °C
Operating Humidity (continuous)	15 - 90% rH
Effect of Humidity Zero Sensitivity	 No effect < ± 0.5% of measured value / % rH
Operating Pressure	90 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < 24% signal loss / year
Calibration Gas	Nitric Oxide (25 - 75ppm, default 50ppm)
Challenge Gas (Bump Test)	Nitric Oxide (NO 50ppm)
Warm Up Time	< 10 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

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Midas®-M Nitric Oxide (NO) Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm NO)
Carbon Monoxide	CO	300	0
Hydrogen Sulphide	H_2S	15	1.5
Nitrogen Dioxide	NO_2	5	<1.5
Sulphur Dioxide	SO_2	5	0

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Manuals and other information about this product are available at:
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HIS_GAS_Midas_Nitric Oxide (NO)_DTS_EN_1219

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MIDAS®-M HYDROGEN SULFIDE (H_2S)

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	HYDROGEN SULFIDE (H_2S)
Cartridge Part Number	MMS-H4
Sensor Technology	3 electrode electrochemical cell
Measuring Range	H_2S 0 - 40ppm
Default Alarm 1	5 ppm (rising)
Default Alarm 2	10 ppm (rising)
Accuracy	< ± 4% of measured value Exposure to H_2S 20ppm for 5 minutes
Response Time ($t_{62.5}$)	Typical 10 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 0.004ppm / °C < ± 0.7% of measured value / °C
Operating Humidity (continuous)	15 - 90% rH
Effect of Humidity Zero Sensitivity	 < ± 0.04ppm / % rH < ± 0.5% of measured value / % rH
Operating Pressure	70 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < 0.5 ppm / year < 20% output / year
Calibration Gas	Hydrogen Sulfide (10 - 30ppm, default 20ppm)
Challenge Gas (Bump Test)	Hydrogen Sulfide (H2S 20ppm)
Warm Up Time	< 10 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

NOTE: The H_2S sensor should not be used with SiH_4 or PH_3 sensor in same Midas-M unit

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Midas®-M Hydrogen Sulfide (H_2S) Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm H_2S)
Ammonia	NH_3	50	0
Carbon monoxide	CO	100	< 2
Carbon dioxide	CO_2	5000	0
Chlorine	Cl_2	0.5	0
Ethylene	C_2H_4	100	0
Hydrogen	H_2	100	0
Hydrogen sulfide	H_2S	10	10
Nitric oxide	NO	25	0
Nitrogen dioxide	NO_2	3	0
Sulfur dioxide	SO_2	2	0

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Manuals and other information about this product are available at:
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HIS_GAS_Midas_Hydrogen Sulfide (H2S)_DTS_EN_1219

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MIDAS®-M HYDROGEN CYANIDE (HCN)

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	HYDROGEN CYANIDE (HCN)
Cartridge Part Number	MMS-Y2
Sensor Technology	3 electrode electrochemical cell
Measuring Range	HCN 0 - 20ppm
Default Alarm 1	2.5 ppm (rising)
Default Alarm 2	4.7 ppm (rising)
Accuracy	< ± 20% of measured value Exposure to HCN 10ppm for 5 minutes
Response Time ($t_{62.5}$)	Typical 15 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 No effect < ± 1% of measured value / °C
Operating Humidity (continuous)	15 - 90% rH
Effect of Humidity Zero Sensitivity	 No effect < ± 1% of measured value / % rH
Operating Pressure	90 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < ± 2% of measured value / month
Calibration Gas	Hydrogen Cyanide (5 - 15ppm, default 10ppm)
Challenge Gas (Bump Test)	Hydrogen Cyanide (15ppm)
Warm Up Time	< 10 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

NOTE: The HCN sensor should not be used with HF sensor in same Midas-M unit

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Midas®-M Hydrogen Cyanide (HCN) Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm HCN)
Carbon Monoxide	CO	300	< 15
Hydrogen Sulphide	H_2S	20	> 20
Ethylene	C_2H_4	100	< 25
Nitrogen Dioxide	NO_2	5	-20 to < -10
Nitric Oxide	NO	35	-17.5 to 0
Sulphur Dioxide	SO_2	4	< 8.3
Isopropyl Alcohol	C_3H_8O	5000	< -4.4
Hydrogen Chloride	HCl	4	< 5.3
Silane	SiH_4	10	> 20
Hydrogen	H_2S	500	< 7.5
Phosphine	PH_3	0.6	< 10.8

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HIS_GAS_Midas_Hydrogen Cyanide (HCN)_DTS_EN_1219

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MIDAS®-M
HCl GROUP

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	HYDROGEN CHLORIDE (HCl)
Cartridge Part Number	MMS-E2
Sensor Technology	3 electrode electrochemical cell
Measuring Range	HCl 0 - 8 ppm
Default Alarm 1	1 ppm (rising)
Default Alarm 2	2 ppm (rising)
Accuracy	< ± 5% of measured value Exposure to HCl 4ppm for 5 minutes
Response Time ($t_{62.5}$)	Typical 21 seconds based on indication at 3 minutes
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 0.008pm / °C < ± 0.7% of measured value / °C
Operating Humidity (continuous)	20 - 75% rH
Effect of Humidity Zero Sensitivity	 < ± 0.002ppm / % rH < ± 0.4% of measured value / % rH
Operating Pressure	90 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 Negligible < 15% of measured value / year
Calibration Gas	Hydrogen Chloride (2 - 6ppm, default 4ppm)
Challenge Gas (Bump Test)	Hydrogen Chloride (4 - 6ppm)
Warm Up Time	< 20 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

NOTE: The HCl sensor should not be used with NH_3 sensor in same Midas-M unit
NOTE: The abrupt pressure change due to flow load change can cause false gas readings or false alarms.

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Midas®-M HCl Group Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE
Boron Trichloride	BCl_3	0 - 8ppm
Dichlorosilane	SiH_2Cl_2	0 - 8ppm
Hydrogen Bromide	HBr	0 - 8ppm

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm HCl)
Arsine	AsH_3	1	0
Carbon Monoxide	CO	2000	0
Chlorine	Cl_2	1	3.5
Diborane	B_2H_6	1	-1.3
Hydrogen	H_2	20000	0
Hydrogen Fluoride	HF	6	8 (Overrange)
Hydrogen Sulfide	H_2S	25	-3.6
Iso Propanol	C_3H_7OH	500	0
Methanol	CH_3OH	500	0
Nitrogen Dioxide	NO_2	5	0.9
Ozone	O_3	0.2	1.8
Phosphine	PH_3	1	-0.14
Sulfur Dioxide	SO_2	4	4.1

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Manuals and other information about this product are available at:
www.honeywellanalytics.com/en/products/Midas-M

HIS_GAS_Midas_HCI Group_DTS_EN_1219

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MIDAS®-M
FLAMMABLE GASES

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	METHANE (CH_4)
Cartridge Part Number	MMS-F3
Sensor Technology	Catalytic bead sensor
Measuring Range	Methane 0 - 100%LEL
Default Alarm 1	12.5%LEL (rising)
Default Alarm 2	25%LEL (rising)
Accuracy	< ± 10% of measured value Exposure to CH_4 50%LEL for 5 minutes
Response Time ($t_{62.5}$)	Typical 5 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 1% fsd < ± 10% fsd
Operating Humidity (continuous)	0 - 80% rH
Effect of Humidity Zero Sensitivity	 < ± 1% fsd < ± 2% fsd
Operating Pressure	75 - 125kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < 12.5% signal loss / year
Calibration Gas	Methane (25 - 75%LEL, default 50%LEL)
Challenge Gas (Bump Test)	Methane (1%vol)
Warm Up Time	< 20 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

NOTE: It is recommended to perform zero calibration every 3 months to prevent baseline drift

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Midas®-M Flammable Gases Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE
Hydrogen	H_2	0 - 100%LEL
Ethylene	C_2H_4	0 - 100%LEL
Propylene	C_3H_6	0 - 100%LEL
Propane	C_3H_8	0 - 100%LEL
Butane	C_4H_{10}	0 - 100%LEL
Octane	C_8H_{18}	0 - 100%LEL

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (%LEL CH_4)

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MIDAS®-M ETO GROUP

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	ETO (C_2H_4O)
Cartridge Part Number	MMS-ET
Sensor Technology	3 electrode electrochemical cell
Measuring Range	ETO 0 - 40ppm
Default Alarm 1	5 ppm (rising)
Default Alarm 2	10 ppm (rising)
Accuracy	< ± 10% of measured value Exposure to ETO 20ppm for 5 minutes
Response Time ($t_{62.5}$)	Typical 25 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 0.15 ppm / °C < ± 1.8% of measured value / °C
Operating Humidity (continuous)	10 - 90% rH
Effect of Humidity Zero Sensitivity	 No effect < ± 1 % of measured value / %rH
Operating Pressure	90 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < 5% signal loss / year
Calibration Gas	ETO (10 - 30ppm, default 20ppm)
Challenge Gas (Bump Test)	ETO (C2H4O 20ppm)
Warm Up Time	< 10 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

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Midas®-M ETO Group Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE
TEOS	$SiC_8H_{20}O_4$	0 - 40ppm

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm ETO)
Carbon Monoxide	CO	50	22
Methyl-ethyl-ketone	C_4H_8O		~10%
Ethanol	C_2H_5OH		~55%
Toulene	C_7H_8		~20%
Iso Propanol	C_3H_7OH	1000	40 (Overrange)
Silane	SiH_4	10	15
Hydrogen Sulfide	H_2S	20	38
Nitric Oxide	NO	50	36.6

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MIDAS®-M
CARBON MONOXIDE (CO)_ LOW CROSS SENSITIVITY

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	CARBON MONOXIDE (CO)
Cartridge Part Number	MMS-C3
Sensor Technology	3 electrode electrochemical cell
Measuring Range	CO 0 - 100ppm
Default Alarm 1	12.5 ppm (rising)
Default Alarm 2	25 ppm (rising)
Accuracy	< ± 10% of measured value Exposure to CO 50ppm for 5 minutes
Response Time ($t_{62.5}$)	Typical 10 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 0.035ppm / °C < ± 0.8% of measured value / °C
Operating Humidity (continuous)	15 - 90% rH
Effect of Humidity Zero Sensitivity	 < ± 0.02ppm of measured value / % rH No effect
Operating Pressure	90 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < 10% signal loss / year
Calibration Gas	Carbon Monoxide (25 - 75ppm, default 50ppm)
Challenge Gas (Bump Test)	Carbon Monoxide (50ppm)
Warm Up Time	< 10 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

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Midas®-M Carbon Monoxide (CO)_Low Cross Sensitivity

Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm CO)
Hydrogen Sulphide	H_2S	100	-5 < x$ < +5
Sulphur Dioxide	SO_2	5	0
Nitrogen Dioxide	NO_2	35	12
Ethene	C_2H_4	100	60
Nitric Oxide	NO	50	20
Silane	SiH_4	10	40
Hydrogen	H_2	500	20

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Manuals and other information about this product are available at:
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HIS_GAS_Midas_Carbon Monoxide (CO)_Low Cross Sensitivity_
DTS_EN_1219

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MIDAS®-M CARBON DIOXIDE (CO_2)

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	CARBON DIOXIDE (CO_2)
Cartridge Part Number	MMS-TR
Sensor Technology	IR sensor
Measuring Range	CO_2 0 - 2%vol
Default Alarm 1	0.25%vol (rising)
Default Alarm 2	0.5%vol (rising)
Accuracy	< ± 10% of measured value Exposure to CO_2 1%vol for 5 minutes
Response Time ($t_{62.5}$)	Typical 30 seconds
Sensor Cartridge Life Expectancy	60 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 No effect < ± 0.8% of measured value / °C
Operating Humidity (continuous)	0 - 95% rH
Effect of Humidity Zero Sensitivity	 No effect < ± 0.2% of measured value / % rH
Operating Pressure	95 - 105kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < 0.24%vol / year
Calibration Gas	Carbon Dioxide (0.5 - 1.5%vol, default 1%vol)
Challenge Gas (Bump Test)	Carbon Dioxide (CO2 1%vol)
Warm Up Time	< 10 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

NOTE: High purity N_2 should be used for zero calibration.
NOTE: Measuring range of CO_2-1 is from 0 to 2%vol.
NOTE: Measuring range of CO_2-2 is from 0 to 5%vol.
NOTE: Measuring range of CO_2-3 is from 0 to 0.2%vol.

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Midas®-M Carbon Dioxide (CO_2) Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE
Carbon Dioxide(CO_2-2)	CO_2	0 - 5%vol
Carbon Dioxide(CO_2-3)	CO_2	0 - 0.2%vol

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (%vol CO_2)

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HIS_GAS_Midas_Carbon Dioxide (CO2)_DTS_EN_1219

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MIDAS®-M
BROMINE GROUP

Smart Sensor Specifications

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	BRONMINE (BR_2)
Cartridge Part Number	MMS-Q2
Sensor Technology	3 electrode electrochemical cell
Measuring Range	Br_2 0 - 0.4ppm
Default Alarm 1	0.05 ppm (rising)
Default Alarm 2	0.1 ppm (rising)
Accuracy	< ± 5% of measured value Exposure to Br_2 0.2ppm for 5 minutes
Response Time ($t_{62.5}$)	Typical 8 seconds
Sensor Cartridge Life Expectancy	24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature Zero Sensitivity	 < ± 0.002ppm / °C < ± 2% of measured value / °C
Operating Humidity (continuous)	15 - 90% rH
Effect of Humidity Zero Sensitivity	 < ± 0.003ppm / % rH < ± 0.5% of measured value / % rH
Operating Pressure	70 - 110kPa
Effect of Position	No effect in typical application
Long Term Drift Zero Sensitivity	 < 10% output / year
Calibration Gas	Bromine (0.1 - 0.3ppm, default 0.2ppm)
Challenge Gas (Bump Test)	Chlorine (Cl2 0.2ppm)
Warm Up Time	< 20 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on the test data under normal Lab test conditions (20-25 C, 0 - 60%RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed

NOTE: The Br_2 sensor should not be used with NH_3 sensor in same Midas-M unit

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Midas®-M Bromine Group Specifications

OTHER DETECTABLE GASES

The following additional gases can be detected with this sensor cartridge. Sensor performance and characteristics will be representative of the data as tabulated above. Consult the Technical Manual to set up the Midas-M transmitter with the designated identification code for each of the following gas types.

DETECTABLE GAS	CHEMICAL FORMULA	MEASURING RANGE
Chlorine Dioxide	ClO_2	0 - 0.4ppm

CROSS SENSITIVITIES

Each Midas-M sensor is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table below presents typical readings that will be observed when a new sensor cartridge is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/ VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm Br_2)
Ammonia	NH_3	50	0.299
Carbon Monoxide	CO	20000	0
Fluorine	F_2	2	1.583
Hydrogen Chloride	HCl	4	0.727
Hydrogen Flouride	HF	6	1.209
Hydrogen Sulphide	H_2S	25	-17.433
Nitrogen Dioxide	NO_2	50	1.337 (transient)
Ozone	O_3	0.2	0.257
Sulphur Dioxide	SO_2	50	9.733

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