

APPENDIX A

SENSOR SPECIFICATIONS

AMMONIA

(0-50 ppm)

Part No. 011242-D-2

Minimum Indicated Concentration	2 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 20 seconds, successive exposures T ₉₀ : < 90 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds
Temperature Range	-35° to 50°C (-31° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

AMMONIA

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	3 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	5 ppm	None
Hydrogen	asphyxiant	4.0 %v	29 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	no data
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	0.56 ppm	- 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	0.78 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	2 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	1.2 ppm	no data, neg reading expected

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

AMMONIA (0-100 ppm) Part No. 011242-D-1

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 20 seconds, successive exposures T ₉₀ : < 90 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds
Temperature Range	-35° to 50°C (-31° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

AMMONIA

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	3 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	5 ppm	None
Hydrogen	asphyxiant	4.0 %v	29 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	no data
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	0.56 ppm	- 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	0.78 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	2 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	1.2 ppm	no data, neg reading expected

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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SENSOR SPECIFICATIONS

AMMONIA

(Low Interferent)
(0-100 ppm)

Part No. 011243-D-1

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 20 seconds, successive exposures T ₉₀ : < 60 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds
Temperature Range	3° to 50°C (38° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

AMMONIA

Interferent	TLV	LEL	Exposure	Response
Alcohols			1000 ppm	None
Carbon Monoxide	25 ppm	12.5 %v	1000 ppm	None
Chlorine	0.5 ppm	***	1 ppm	None
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	1 %vol	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	20 ppm	+ 1 ppm *

Interferent Notes

(*) Long term exposure may damage sensor.

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

AMMONIA (Low Interferent) (0-300 ppm)

Part No. 011243-D-2

Minimum Indicated Concentration	10 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 20 seconds, successive exposures T ₉₀ : < 60 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds
Temperature Range	3° to 50°C (38° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent [†])	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

AMMONIA

Interferent	TLV	LEL	Exposure	Response
Alcohols			1000 ppm	None
Carbon Monoxide	25 ppm	12.5 %v	1000 ppm	None
Chlorine	0.5 ppm	***	1 ppm	None
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	1 %vol	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	20 ppm	+ 1 ppm *

Interferent Notes

(*) Long term exposure may damage sensor.

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blanking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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AMMONIA (0-500 ppm) Part No. 011342-D-1

Minimum Indicated Concentration	16 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 20 seconds, successive exposures T ₉₀ : < 90 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds
Temperature Range	-35° to 50°C (-31° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

AMMONIA

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	100 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	5 ppm	None
Hydrogen	asphyxiant	4.0 %v	40 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	10 ppm	None
Nitrogen Dioxide	3 ppm	***	10 ppm	no data
Sulfur Dioxide	2 ppm	***	2 ppm	None

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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SENSOR SPECIFICATIONS

ARSINE

(0-1.00 ppm)

Part No. 121042-D-1

Minimum Indicated Concentration	0.04 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

ARSINE

Interferent	TLV	LEL	Exposure	Response
Acetylene	asphyxiant	2.5 %v	ppm-range	No Data-Pos(+) Interferent
Carbon Monoxide	25 ppm	12.5 %v	300 ppm	None
Diborane	0.1 ppm	0.8 %v	1.3 ppm	+ 1 ppm
Germane	0.2 ppm	***	0.5 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	3000 ppm	+ 1 ppm
Phosphine	0.3 ppm	***	0.8 ppm	+ 1 ppm
Silane	5 ppm	***	1.8 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	4 ppm	No Data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

CARBON DIOXIDE
(INFRARED)
[use only with IR Transmitters]
(0-2.00 %vol)
Part No. 052055-D-1

Minimum Indicated Concentration	0.07 %vol
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 0.01 %vol change per month (typical)
Span Drift	< 0.05 %vol change per month (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Temperature Range	-20° to 55°C (-4° to 131°F)**
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

** Above 51°C transmitter LCD begins to fade.

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CARBON MONOXIDE

(0-100 ppm)

Part No. 195272-D-1

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 45 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

CARBON MONOXIDE

Interferent	TLV	LEL	Exposure	Response
Chlorine	0.5 ppm	***	1 ppm	None
Ethylene	asphyxiant	3.1 %v	1.3 ppm	+ 1 ppm
Hydrogen	asphyxiant	4.0 %v	1.7 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	5 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	50 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	5 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	5 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	None

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

CARBON MONOXIDE

(0-500 ppm)

Part No. 195272-D-2

Minimum Indicated Concentration	16 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 45 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

CARBON MONOXIDE

Interferent	TLV	LEL	Exposure	Response
Chlorine	0.5 ppm	***	1 ppm	None
Ethylene	asphyxiant	3.1 %v	1.3 ppm	+ 1 ppm
Hydrogen	asphyxiant	4.0 %v	1.7 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	5 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	50 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	5 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	5 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	None

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blanking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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CARBON MONOXIDE **(Low Hydrogen Interference)** **(0-100 ppm)** **Part No. 198262-D-1**

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 10% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 2% change per month (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 45 seconds
Temperature Range	-20° to 45°C (-4° to 113°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.
 * When unit is calibrated and serviced at recommended intervals.

HYDROGEN CROSS-INTERFERENCE
 with Temperature (250 ppm H₂ Challenge)

Temperature	Sensor Output
23° C	23 ppm
45° C	50 ppm

HYDROGEN CROSS-INTERFERENCE
 with Hydrogen Concentration (@ 25° C)

Hydrogen Concentration	Sensor Output
50 ppm	4 ppm
100 ppm	8 ppm
250 ppm	23 ppm
500 ppm	35 ppm

Interferent Notes

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display “blinking” that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

CARBON MONOXIDE
(Low Hydrogen Interference)
(0-500 ppm)
Part No. 198262-D-2

Minimum Indicated Concentration	16 ppm
Repeatability	± 2% of reading
Accuracy *	± 10% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 2% change per month (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 45 seconds
Temperature Range	-20° to 45°C (-4° to 113°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN CROSS-INTERFERENCE
with Temperature (250 ppm H₂ Challenge)

Temperature	Sensor Output
23° C	23 ppm
45° C	50 ppm

HYDROGEN CROSS-INTERFERENCE
with Hydrogen Concentration (@ 25° C)

Hydrogen Concentration	Sensor Output
50 ppm	4 ppm
100 ppm	8 ppm
250 ppm	23 ppm
500 ppm	35 ppm

Interferent Notes

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display “blanking” that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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Minimum Indicated Concentration	0.16 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-35° to 50°C (-31° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ±1% by volcum, mMinimu

CHLORINE

(0-10.0 ppm)

Part No. 025142-D-1

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-35° to 50°C (-31° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent [†])	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

CHLORINE

Interferent	TLV	LEL	Exposure	Response
Bromine	0.1 ppm	***	1.0 ppm	+ 1 ppm
Carbon Monoxide	25 ppm	12.5 %v	300 ppm	None
Chlorine Dioxide	0.1 ppm	***	5 ppm	+ 1 ppm
Fluorine	0.1 ppm	***	2.3 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	1000 ppm	None
Hydrogen Chloride	C 5 ppm	***	60 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	33 ppm	- 1 ppm *
Nitrogen Dioxide	3 ppm	***	8 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	None

Interferent Notes

(*) Long term exposure may damage sensor.

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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SENSOR SPECIFICATIONS

CHLORINE

(Refillable)

(0-10.0 ppm)

Part No. 021201-D-1

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 10% of reading
Accuracy *	± 10% of reading
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per month (typical)
Response Time (Rise)	T ₅₀ : < 30 seconds, successive exposures T ₉₀ : < 60 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 180 seconds
Temperature Range (continuous)	-5° to 45°C (23°F to 113°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	None
Position Requirement	± 30° from vertical

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

CHLORINE

Interferent	TLV	LEL	Exposure	Response
Bromine	0.1 ppm	***	2.5 ppm	+ 1 ppm
Carbon Monoxide	25 ppm	12.5 %v	200 ppm	None
Chlorine Dioxide	0.1 ppm	***	10 ppm	+ 1 ppm
Fluorine	0.1 ppm	***	0.8 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	4.5 ppm	- 1 ppm
Hydrogen Chloride	C 5 ppm	***	1000 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	200 ppm	None
Nitrogen Dioxide	3 ppm	***	670 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	No Data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

CHLORINE

(0-100 ppm)

Part No. 021232-D-3

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 18 seconds, (typical) T ₉₀ : < 60 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent [†])	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

CHLORINE

Interferent	TLV	LEL	Exposure	Response
Bromine	0.1 ppm	***	1.8 ppm	+ 1 ppm
Carbon Monoxide	25 ppm	12.5 %v	300 ppm	None
Chlorine Dioxide	0.1 ppm	***	0.3–0.5 ppm	+ 1 ppm
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	100 ppm	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	10 ppm	- 1 ppm
Nitric Oxide	25 ppm	***	35 ppm	None
Nitrogen Dioxide	3 ppm	***	1 ppm	+ 1 ppm
Ozone	0.05 ppm	***	0.7 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	100 ppm	- 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

APPENDIX A

SENSOR SPECIFICATIONS

CHLORINE DIOXIDE

(0-1.00 ppm)

Part No. 391042-D-1

Minimum Indicated Concentration	0.03 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 20 seconds, successive exposures T ₉₀ : < 120 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range (continuous)	-20° to 50°C (-4°F to 122°F)
Humidity Range (continuous)	10–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

CHLORINE DIOXIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	1000 ppm	None
Chlorine	0.5 ppm	***	5 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	1 %vol	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	10 ppm	None *
Ozone	0.05 ppm	***	3.3 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	2 ppm	None

* At exposures < 15 ppm•hrs, longer/higher exposures can break through the filter, causing negative readings as well as filter blockage to ClO₂.

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

CHLORINE DIOXIDE

(0-5.00 ppm)

Part No. 391042-D-2

Minimum Indicated Concentration	0.03 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 20 seconds, successive exposures T ₉₀ : < 120 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range (continuous)	-20° to 50°C (-4°F to 122°F)
Humidity Range (continuous)	10–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

CHLORINE DIOXIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	1000 ppm	None
Chlorine	0.5 ppm	***	5 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	1 %vol	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	10 ppm	None *
Ozone	0.05 ppm	***	3.3 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	2 ppm	None

* At exposures < 15 ppm•hrs, longer/higher exposures can break through the filter, causing negative readings as well as filter blockage to ClO₂.

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A
SENSOR SPECIFICATIONS

ACETYLENE
(INFRARED)
[use only with IR Transmitters]
(0-100 %LEL)
Part No. 491255-D-1

Minimum Indicated Concentration	4 %LEL
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	5% change per year (typical)
Span Drift	10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Temperature Range	-20° to 55°C (-4° to 131°F)**
Humidity Range (continuous)	5-95 %RH, non-condensing
Humidity Range (intermittent)	0-99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM

* When unit is calibrated and serviced at recommended intervals.

** Above 51°C transmitter LCD begins to fade.

CLASS I, DIVISION 2, GROUPS A, B, C, & D

COMBUSTIBLE GAS
(CATALYTIC BEAD)
(0-100 %LEL)
Part No. 111250-D-1

Minimum Indicated Concentration	4 %LEL
Repeatability	± 2% of reading
Accuracy *	± 3% 0-50 %LEL, ± 5% 50-100 %LEL
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, successive exposures T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 30 seconds
Temperature Range (continuous)	-20° to 55°C (-4°F to 131°F)
Humidity Range (continuous)	5-95 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	10 %vol, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

†† Recovery times may increase to 5 minutes in explosion-proof versions due to gas trapped in the void space inside the sensor cover.

NOTE

For Methane and Propane k-Factors see Appendix B

APPENDIX A

SENSOR SPECIFICATIONS

COMBUSTIBLE GAS **(CATALYTIC BEAD for Hydrogen)** **(0-100 %LEL)** **Part No. 111253-D-1**

Minimum Indicated Concentration	4 %LEL
Repeatability	± 2% of reading
Accuracy *	± 3% 0-50 %LEL, ± 5% 50-100 %LEL
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, successive exposures T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 30 seconds
Temperature Range (continuous)	-20° to 55°C (-4°F to 131°F)
Humidity Range (continuous)	5-95 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	10 %vol, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

†† Recovery times may increase to 5 minutes in explosion-proof versions due to gas trapped in the void space inside the sensor cover.

NOTE

The Hydrogen specific catalytic bead combustible sensor will also sense gases detectable by the catalytic bead combustible sensor (PN° 111250-D-1), however the interferences are not linear.

COMBUSTIBLE GAS
(INFRARED for Methane Gas)
[use only with IR Transmitters]
(0-100 %LEL)

Part No. 111255-D-1

Minimum Indicated Concentration	4 %LEL
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	5% change per year (typical)
Span Drift	10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 6 seconds, (typical) T ₉₀ : < 20 seconds, successive exposures
Temperature Range	-20° to 55°C (-4° to 131°F)**
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

** Above 51°C transmitter LCD begins to fade.

NOTE

***The Methane IR sensor will also sense gases detectable
by the non-Methane IR sensor (PN° 111255-D-2),
however the interferences are not linear.***

APPENDIX A

SENSOR SPECIFICATIONS

COMBUSTIBLE GAS

(INFRARED for non-Methane Hydrocarbons)
 [use only with IR Transmitters]
 (0-100 %LEL)
 Part No. 111255-D-2

Minimum Indicated Concentration	4 %LEL
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	5% change per year (typical)
Span Drift	10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 6 seconds, (typical) T ₉₀ : < 20 seconds, successive exposures
Temperature Range	-20° to 55°C (-4° to 131°F)**
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow rate	1.0 LPM

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

** Above 51°C transmitter LCD begins to fade.

Propane Equivalents

Combustible Gas/Vapor	Propane k-Factor
Acetone	2.37
Butadiene	2.54
Butane	1.19
Dimethyl Ether	1.00
Ethylene	2.44
Heptane	2 *
Hexane	1.61
Pentane (use for Gasoline)	1.20
Propane	1.00
Propylene	1.84
Methanol	0.57
Ethyl Acetate	1.40
o-Xylene	1.41

* estimated data

DIBORANE

(0-1.00 ppm)

Part No. 291042-D-1

Minimum Indicated Concentration	0.04 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 45 seconds, (typical) T ₉₀ : < 10 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 30 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

DIBORANE

Interferent	TLV	LEL	Exposure	Response
Acetylene	asphyxiant	2.5 %v	ppm range	No Data-Pos(+) Interferent
Arsine	0.05 ppm	***	0.8 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Germane	0.2 ppm	***	1.6 ppm	+ 1 ppm
Hydrogen	asphyxiant	4.0 %v	3000 ppm	None
Phosphine	0.3 ppm	***	1 ppm	+ 1 ppm
Silane	5 ppm	***	0.6 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	4 ppm	No Data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

ETHYLENE OXIDE

(0-10.0 ppm)

Part No. 452132-D-1

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 45 seconds, (typical) T ₉₀ : < 140 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 100 seconds
Temperature Range **	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

ETHYLENE OXIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	2.8 ppm	+ 1 ppm
Ethanol	1000 ppm	3.3 %v	1.5 ppm	+ 1 ppm
Ethylene	asphyxiant	3.1 %v	1.2 ppm	+ 1 ppm
Hydrogen	asphyxiant	4.0 %v	33 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	0.5 ppm	+ 1 ppm
Methanol	200 ppm	6.0 %v	0.7 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	1.3 ppm	+ 1 ppm
Nitrogen Oxide	3 ppm	***	11 ppm	+ 1 ppm
Ozone	0.05 ppm	***	1.2 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	2.8 ppm	+ 1 ppm
Toluene	50 ppm	1.4 %v	13.7 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

FLUORINE

(0-10.0 ppm)

Part No. 151142-D-1

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent [†])	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

FLUORINE

Interferent	TLV	LEL	Exposure	Response
Bromine	0.1 ppm	***	2.3 ppm	+ 1 ppm
Carbon Monoxide	25 ppm	12.5 %v	100 ppm	None
Chlorine	0.5 ppm	***	2.3 ppm	+ 1 ppm
Chlorine Dioxide	0.1 ppm	***	12 ppm	+ 1 ppm
Hydrocarbons	asphyxiant	3.1 %v	%-range	None
Hydrogen	asphyxiant	4.0 %v	1000 ppm	None
Hydrogen Chloride	C 5 ppm	***	136 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	33 ppm	- 1 ppm *
Nitric Oxide	25 ppm	***	100 ppm	None
Nitrogen Dioxide	3 ppm	***	19 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column). (*) Continuous exposure will poison cell.

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

FLUORINE

(0-25.0 ppm)

Part No. 151142-D-2

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

FLUORINE

Interferent	TLV	LEL	Exposure	Response
Bromine	0.1 ppm	***	2.3 ppm	+ 1 ppm
Carbon Monoxide	25 ppm	12.5 %v	100 ppm	None
Chlorine	0.5 ppm	***	2.3 ppm	+ 1 ppm
Chlorine Dioxide	0.1 ppm	***	12 ppm	+ 1 ppm
Hydrocarbons	asphyxiant	3.1 %v	%-range	None
Hydrogen	asphyxiant	4.0 %v	1000 ppm	None
Hydrogen Chloride	C 5 ppm	***	136 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	33 ppm	- 1 ppm *
Nitric Oxide	25 ppm	***	100 ppm	None
Nitrogen Dioxide	3 ppm	***	19 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column). (*) Continuous exposure will poison cell.

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

GERMANE

(0-2.00 ppm)

Part No. 302042-D-1

Minimum Indicated Concentration	0.07 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 180 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

GERMANE

Interferent	TLV	LEL	Exposure	Response
Acetylene	asphyxiant	2.5 %v	ppm range	No Data-Pos(+) Interferent
Arsine	0.05 ppm	***	1.05 ppm	+ 1 ppm
Carbon Monoxide	25 ppm	12.5 %v	300 ppm	None
Diborane	0.1 ppm	0.8 %v	0.6 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	3000 ppm	None
Phosphine	0.3 ppm	***	1 ppm	+ 1 ppm
Silane	5 ppm	***	1.2 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	4 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

HYDRAZINE

(0-1.00 ppm)

Part No. 481042-D-1

Minimum Indicated Concentration	0.04 ppm
Repeatability	± 5% of reading
Accuracy *	± 10% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 5% change per month
Response Time (Rise)	T ₅₀ : < 30 seconds, (typical) T ₉₀ : < 120 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds [estimated]
Temperature Range **	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDRAZINE

Interferent	TLV	LEL	Exposure	Response
Arsine	0.05 ppm	5.1 %v	1 ppm	+ 1 ppm
Carbon Monoxide	25 ppm	12.5 %v	1000 ppm	None
Chlorine	0.5 ppm	***	1 ppm	None
Hydrocarbons			%vol Range	None
Hydrogen Chloride	C 5 ppm	***	50 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	5 ppm	no data
Hydrogen Sulfide	10 ppm	4.0 %v	10 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	4 ppm	- 1 ppm
Phosphine	0.3 ppm	1.8 %v	3 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

HYDROGEN

(0-1000 ppm)

Part No. 101332-D-1

Minimum Indicated Concentration	31 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent [†])	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	5 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	1 ppm	None
Ethylene	asphyxiant	3.1 %v	1.3 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	4 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	5 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	4 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	5 ppm	None
Sulfur Dioxide	2 ppm	***	5 ppm	None

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blanking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

APPENDIX A

SENSOR SPECIFICATIONS

HYDROGEN

(0-100 %LEL, Electrochemical)

Part No. 101236-D-1

Minimum Indicated Concentration	4 %LEL
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 30 seconds, (typical) T ₉₀ : < 120 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	2.5 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	1 ppm	None
Ethylene	asphyxiant	3.1 %v	2.5 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	1 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	1.5 ppm	+ 1 ppm
Methane	asphyxiant	5.0 %v	2.5 %vol	None
Nitric Oxide	25 ppm	***	3.5 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	5 ppm	None

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

HYDROGEN CHLORIDE

(0-10.0 ppm)

Part No. 083142-D-3X

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 3% change per month (typical)
Response Time (Rise)	T ₅₀ : < 30 seconds, successive exposures T ₉₀ : < 70 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 90 seconds
Temperature Range (continuous)	-20° to 50°C (-4°F to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN CHLORIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	91 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	5 ppm	+ 1 ppm
Hydrocarbons	asphyxiant		% Range	None
Hydrogen	asphyxiant	4.0 %v	1 %vol	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	15 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	3.6 ppm	+ 1 ppm
Hydrogen Bromide		***	1 ppm	+ 1 ppm
Hydrogen Fluoride	C 3 ppm	***	3 ppm	None
Sulfur Dioxide	2 ppm	***	5 ppm	no data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

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SENSOR SPECIFICATIONS

HYDROGEN CHLORIDE

(Refillable)

(0-10.0 ppm)

Part No. 081201-D-1X

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 10% of reading
Accuracy *	± 10% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 3% change per month (typical)
Response Time (Rise)	T ₅₀ : < 40 seconds, successive exposures T ₉₀ : < 180 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 180 seconds
Temperature Range (continuous)	-5° to 40°C (23°F to 104°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	None
Position Requirement	± 30° from vertical

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN CHLORIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	91 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	5 ppm	+ 1 ppm
Hydrocarbons	asphyxiant		% Range	None
Hydrogen	asphyxiant	4.0 %v	1 %vol	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	15 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	3.6 ppm	+ 1 ppm
Hydrogen Bromide		***	1 ppm	+ 1 ppm
Hydrogen Fluoride	C 3 ppm	***	3 ppm	None
Sulfur Dioxide	2 ppm	***	5 ppm	no data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

HYDROGEN CHLORIDE

(0-20.0 ppm)

Part No. 083142-D-1

Minimum Indicated Concentration	0.7 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 3% change per month (typical)
Response Time (Rise)	T ₅₀ : < 30 seconds, successive exposures T ₉₀ : < 70 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 90 seconds
Temperature Range (continuous)	-20° to 50°C (-4°F to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN CHLORIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	91 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	5 ppm	+ 1 ppm
Hydrocarbons	asphyxiant		% Range	None
Hydrogen	asphyxiant	4.0 %v	1 %vol	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	15 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	3.6 ppm	+ 1 ppm
Hydrogen Bromide		***	1 ppm	+ 1 ppm
Hydrogen Fluoride	C 3 ppm	***	3 ppm	None
Sulfur Dioxide	2 ppm	***	5 ppm	no data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

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SENSOR SPECIFICATIONS

HYDROGEN CHLORIDE

(0-100 ppm)

Part No. 081232-D-2

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 36 seconds, (typical) T ₉₀ : < 120 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 90 seconds
Temperature Range (continuous)	-20° to 50°C (-4°F to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN CHLORIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	100 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	10 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	33 ppm	+ 1 ppm
Hydrogen	asphyxiant	4.0 %v	200 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	30 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	1.1 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	35 ppm	None
Nitrogen Dioxide	3 ppm	***	10 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	1.4 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

HYDROGEN CYANIDE

(0-20.0 ppm)

Part No. 031232-D-1

Minimum Indicated Concentration	0.7 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 45 seconds, (typical) T ₉₀ : < 150 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 100 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN CYANIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	9 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	2 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	3 ppm	+ 1 ppm
Hydrogen	asphyxiant	4.0 %v	200 ppm	None
Hydrogen Chloride	C 5 ppm	5.6 %v	5 ppm	no data
Hydrogen Sulfide	10 ppm	4.0 %v	100 ppm	(see Note)
Nitric Oxide	25 ppm	***	2.5 ppm	- 1 ppm
Nitrogen Dioxide	3 ppm	***	0.3 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	0.3 ppm	+ 1 ppm

Note: Due to the extremely high cross sensitivity (> 350%), this sensor is not suitable for use in atmospheres containing H₂S.

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blanking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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SENSOR SPECIFICATIONS

HYDROGEN CYANIDE

(0-100 ppm)

Part No. 031232-D-2X

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 45 seconds, (typical) T ₉₀ : < 150 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 100 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN CYANIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	9 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	2 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	3 ppm	+ 1 ppm
Hydrogen	asphyxiant	4.0 %v	200 ppm	None
Hydrogen Chloride	C 5 ppm	5.6 %v	5 ppm	no data
Hydrogen Sulfide	10 ppm	4.0 %v	100 ppm	(see Note)
Nitric Oxide	25 ppm	***	2.5 ppm	- 1 ppm
Nitrogen Dioxide	3 ppm	***	0.3 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	0.3 ppm	+ 1 ppm

Note: Due to the extremely high cross sensitivity (> 350%), this sensor is not suitable for use in atmospheres containing H₂S.

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

HYDROGEN FLUORIDE

(0-10.0 ppm)

Part No. 071142-D-1

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per month (typical)
Response Time (Rise)	T ₅₀ : < 40 seconds T ₉₀ : < 90 seconds
Recovery Time (Fall)	T ₁₀ : < 70 seconds
Temperature Range (continuous)	-20° to 50°C (-4°F to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing <i>(Note: High humidity causes HF absorption)</i>
Humidity Range (intermittent [†])	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN FLUORIDE

Interferent	TLV	LEL	Exposure	Response
Arsine	0.05 ppm	***	0.1 ppm	None
Boron Trifluoride	C 1 ppm	***	2.7 ppm	+ 1 ppm * #
Carbon Monoxide	25 ppm	12.5 %v	1000 ppm	None
Carbon Dioxide	5000 ppm	***	5000 ppm	None
Chlorine	0.5 ppm	***	2.5 ppm	+ 1 ppm
Chlorine Trifluoride	C 0.1 ppm	***	1 ppm	no data
Diborane	0.1 ppm	0.8 %v	0.1 ppm	None
Fluorine	1 ppm	***	3 ppm	no data
Germane	0.2 ppm	***	1 ppm	None
Hydrogen	asphyxiant	4.0 %v	1 %vol	None
Hydrochloric Acid	C 5 ppm		1.53 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	10 ppm	None
Nitrogen Dioxide	3 ppm	***	100 ppm	+ 1 ppm
Silicon Fluoride	2.5 mg/m ³	***	0.75 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	1.8 ppm	no data

Interferent Notes

(*) Long term exposure may damage sensor.

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blanking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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HYDROGEN FLUORIDE

(Refillable)

(0-10.0 ppm)

Part No. 071201-D-1

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 10% of reading
Accuracy *	± 10% of reading
Zero Drift	< 5% change per year (typical)
Span Drift	< 3% change per month (typical)
Response Time (Rise)	T ₅₀ : < 60 seconds, successive exposures T ₉₀ : < 300 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 300 seconds
Temperature Range (continuous)	-5° to 40°C (23°F to 104°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	None
Position Requirement	± 30° from vertical

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN FLUORIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	200 ppm	None
Chlorine	0.5 ppm	***	1.5 ppm	+ 1 ppm
Hydrocarbons	asphyxiant		% Range	None
Hydrogen	asphyxiant	4.0 %v	5 %vol	- 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	200 ppm	None
Hydrogen Chloride	C 5 ppm	***	1.8 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	1.3 ppm	no data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column). (#) Exposure will damage sensor.

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

* Level varies with moisture content.

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APPENDIX A

SENSOR SPECIFICATIONS

HYDROGEN SULFIDE

(0-50 ppm)

Part No. 062272-D-1

Minimum Indicated Concentration	2 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-35° to 50°C (-31° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN SULFIDE

Interferent	TLV	LEL	Exposure	Response
Ammonia	25 ppm	15 %v	100 ppm	None
Carbon Monoxide	25 ppm	12.5 %v	50 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	20 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	700 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	7 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	35 ppm	None
Nitrogen Dioxide	3 ppm	***	5 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

HYDROGEN SULFIDE

(0-100 ppm)

Part No. 062272-D-2

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 60 seconds
Temperature Range	-35° to 50°C (-31° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

* When unit is calibrated and serviced at recommended intervals.

HYDROGEN SULFIDE

Interferent	TLV	LEL	Exposure	Response
Ammonia	25 ppm	15 %v	100 ppm	None
Carbon Monoxide	25 ppm	12.5 %v	50 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	20 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	700 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	7 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	35 ppm	None
Nitrogen Dioxide	3 ppm	***	5 ppm	- 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blanking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

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SENSOR SPECIFICATIONS

NITRIC OXIDE

(0-100 ppm)

Part No. 421232-D-1

Minimum Indicated Concentration	4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 5 seconds, (typical) T ₉₀ : < 15 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 30 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

NITRIC OXIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	300 ppm	None
Chlorine	0.5 ppm	***	1 ppm	None
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	100 ppm	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	3 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	3 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	None

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 4 ppm. This is due to display "blinking" that occurs between -3 ppm and + 3 ppm on transmitters that display gas concentrations as whole numbers (no decimals).

NITROGEN DIOXIDE

(0-10.0 ppm)

Part No. 211232-D-1

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 5% of reading
Accuracy *	± 10% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 15 seconds, (typical) T ₉₀ : < 40 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 45 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent [†])	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

NITROGEN DIOXIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	300 ppm	None
Chlorine	0.5 ppm	***	1 ppm	+ 1 ppm
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	100 ppm	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	10 ppm	- 1 ppm
Nitric Oxide	25 ppm	***	35 ppm	None
Sulfur Dioxide	2 ppm	***	100 ppm	- 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

OXYGEN

(Process)
(0-10.0 %vol)

Part No. 403162-D-2X

Min. Indicated Concentration Change 0.1 %vol
 Span Drift < 10% change per year (typical)
 Response Time (Rise) T₉₀: < 10 seconds (from 0 to 20.9 %vol O₂)
 Temperature Range -20° to 50°C (-4° to 122°F)
 Humidity Range (continuous) 5–95 %RH, non-condensing
 Pressure Range Ambient atmospheric, ± 1 psi
 Recommended Calibration Flow Rate 1.0 LPM

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

OXYGEN [%vol]

Interferent	TLV	LEL	Exposure	Response
Carbon Dioxide	5000 ppm	***	10 %vol	+ 1 %vol
Carbon Monoxide	25 ppm	12.5 %v	40 %vol	< - 1 %vol
Chlorine	0.5 ppm	***	> 1 %vol	+ 1 %vol
Hydrogen	asphyxiant	4.0 %v	50 %vol	< - 1 %vol
Methane	asphyxiant	5.0 %v	< 100 %vol	None
Nitrogen Dioxide	3 ppm	***	2 %vol	+ 1 %vol
Ozone	0.05 ppm	***	> 1 %vol	+ 1 %vol

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.4 ppm. This is due to display "blinking" that occurs between - 0.3 %vol and + 0.3 %vol on transmitters that display gas concentrations with one digit after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

OXYGEN

(Ambient Air)
(0-25.0 %vol)

Part No. 403162-D-1

Min. Indicated Concentration Change 0.1 %vol
 Span Drift < 10% change per year (typical)
 Response Time (Rise) T₉₀: < 10 seconds (from 0 to 20.9 %vol O₂)
 Temperature Range -20° to 50°C (-4° to 122°F)
 Humidity Range (continuous) 5–95 %RH, non-condensing
 Pressure Range Ambient atmospheric, ± 1 psi
 Recommended Calibration Flow Rate 1.0 LPM

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.
^{*} When unit is calibrated and serviced at recommended intervals.

OXYGEN [%vol]

Interferent	TLV	LEL	Exposure	Response
Carbon Dioxide	5000 ppm	***	10 %vol	+ 1 %vol
Carbon Monoxide	25 ppm	12.5 %v	40 %vol	< - 1 %vol
Chlorine	0.5 ppm	***	> 1 %vol	+ 1 %vol
Hydrogen	asphyxiant	4.0 %v	50 %vol	< - 1 %vol
Methane	asphyxiant	5.0 %v	< 100 %vol	None
Nitrogen Dioxide	3 ppm	***	2 %vol	+ 1 %vol
Ozone	0.05 ppm	***	> 1 %vol	+ 1 %vol

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.4 ppm. This is due to display "blanking" that occurs between - 0.3 %vol and + 0.3 %vol on transmitters that display gas concentrations with one digit after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

OXYGEN

(Process)
(0-25.0 %vol)

Part No. 403162-D-3X

Min. Indicated Concentration Change 0.1 %vol
 Span Drift < 10% change per year (typical)
 Response Time (Rise) T₉₀: < 10 seconds (from 0 to 20.9 %vol O₂)
 Temperature Range -20° to 50°C (-4° to 122°F)
 Humidity Range (continuous) 5–95 %RH, non-condensing
 Pressure Range Ambient atmospheric, ± 1 psi
 Recommended Calibration Flow Rate 1.0 LPM

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

OXYGEN [%vol]

Interferent	TLV	LEL	Exposure	Response
Carbon Dioxide	5000 ppm	***	10 %vol	+ 1 %vol
Carbon Monoxide	25 ppm	12.5 %v	40 %vol	< - 1 %vol
Chlorine	0.5 ppm	***	> 1 %vol	+ 1 %vol
Hydrogen	asphyxiant	4.0 %v	50 %vol	< - 1 %vol
Methane	asphyxiant	5.0 %v	< 100 %vol	None
Nitrogen Dioxide	3 ppm	***	2 %vol	+ 1 %vol
Ozone	0.05 ppm	***	> 1 %vol	+ 1 %vol

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.4 ppm. This is due to display "blanking" that occurs between - 0.3 %vol and + 0.3 %vol on transmitters that display gas concentrations with one digit after the decimal.

OZONE

(0–2.00 ppm)

Part No. 432032-D-1

Minimum Indicated Concentration	0.07 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 45 seconds, (typical) T ₉₀ : < 150 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

OZONE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	300 ppm	None
Chlorine	0.5 ppm	***	1 ppm	+ 1 ppm
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	100 ppm	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	8 ppm	- 1 ppm
Nitric Oxide	25 ppm	***	35 ppm	None
Nitrogen Dioxide	3 ppm	***	1.4 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	None

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

PHOSGENE

(0-1.00 ppm)

Part No. 471042-D-1X

Minimum Indicated Concentration	0.04 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : consult factory T ₉₀ : consult factory
Recovery Time (Fall)	T ₁₀ : consult factory
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

PHOSGENE

Interferent	TLV	LEL	Exposure	Response
Alcohols	- - -	- - -	1000 ppm	None
Carbon Dioxide	5000 ppm	***	5000 ppm	None
Carbon Monoxide	25 ppm	12.5 %v	1000 ppm	None
Chlorine	0.5 ppm	***	1 ppm	None
Hydrocarbons	- - -	- - -	100 %v	None
Hydrogen	asphyxiant	4.0 %v	1 %v	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None *
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	5 ppm	None *
Hydrogen Fluoride	3 ppm	***	3 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	1 ppm	None *
Nitrogen	asphyxiant	***	100 %v	None
Phosphine	0.3 ppm	***	0.3 ppm	None
Sulfur Dioxide	2 ppm	***	2 ppm	None

* Gases can poison sensor after filter breakthrough.

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

PHOSPHINE

(0–1.00 ppm)

Part No. 131042-D-1

Minimum Indicated Concentration	0.04 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 10 seconds, (typical) T ₉₀ : < 30 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 180 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

PHOSPHINE

Interferent	TLV	LEL	Exposure	Response
Acetylene	asphyxiant	2.5 %v	ppm range	No Data-Pos(+) Interferent
Arsine	0.05 ppm	***	1.3 ppm	+ 1 ppm
Diborane	0.1 ppm	0.8 %v	1 ppm	+ 1 ppm
Germane	0.2 ppm	***	1.6 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	3000 ppm	None
Silane	5 ppm	***	1.8 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	No Data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

SILANE

(0–10.0 ppm)

Part No. 145142-D-1

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 30 seconds, (typical) T ₉₀ : < 90 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 90 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

SILANE

Interferent	TLV	LEL	Exposure	Response
Arsine	0.05 ppm	***	1.4 ppm	+ 1 ppm
Carbon Monoxide	25 ppm	12.5 %v	28 ppm	+ 1 ppm
Diborane	0.1 ppm	0.8 %v	1.8 ppm	+ 1 ppm
Germane	0.2 ppm	***	1 ppm	+ 1 ppm
Hydrocarbons			%vol range	None
Hydrogen	asphyxiant	4.0 %v	3000 ppm	None
Phosphine	0.3 ppm	***	0.8 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	5 ppm	No Data

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

STYRENE

(0-200 ppm)

Part No. 462273-D-1X

Minimum Indicated Concentration	7 ppm
Repeatability	± 3% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 25 seconds, (typical) T ₉₀ : < 75 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 120 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

STYRENE

Interferent	TLV	LEL	Exposure	Response
Acetylene	asphyxiant	2.5 %v	0.4 ppm	+ 1 ppm
Ammonia	25 ppm	15 %v	100 ppm	None
Carbon Monoxide	25 ppm	12.5 %v	0.8 ppm	+ 1 ppm
Carbonyl Sulfide	---	12 %v	2.7 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	2 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	0.9 ppm	+ 1 ppm
Hydrogen	asphyxiant	4.0 %v	1.3 ppm	+ 1 ppm
Hydrogen Chloride	C 5 ppm	***	16 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	2 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	0.3 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	3.2 ppm	+ 1 ppm
Nitrogen Dioxide	3 ppm	***	1.3 ppm	- 1 ppm
Phosphine	0.3 ppm	***	0.3 ppm	+ 1 ppm
Sulfur Dioxide	2 ppm	***	1.2 ppm	+ 1 ppm
Toluene	50 ppm	1.4 %v	1.6 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

SULFUR DIOXIDE

(0–10.0 ppm)

Part No. 182132-D-3X

Minimum Indicated Concentration	0.7 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 5 seconds, (typical) T ₉₀ : < 15 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 30 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

SULFUR DIOXIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	100 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	2 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	100 ppm	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	2 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	0.8 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	35 ppm	- 1 ppm
Nitrogen Dioxide	3 ppm	***	0.9 ppm	- 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

SULFUR DIOXIDE

(Refillable)
(0-10.0 ppm)

Part No. 181201-D-1X

Minimum Indicated Concentration	0.4 ppm
Repeatability	± 10% of reading
Accuracy *	± 10% of reading
Zero Drift	< 5% change per year (typical)
Span Drift	< 3% change per month (typical)
Response Time (Rise)	T ₅₀ : < 40 seconds, successive exposures T ₉₀ : < 240 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 240 seconds
Temperature Range (continuous)	-5° to 40°C (23°F to 104°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent [†])	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	None
Position Requirement	± 30° from vertical

[†] Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

SULFUR DIOXIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	200 ppm	None
Chlorine	0.5 ppm	***	1.5 ppm	+ 1 ppm
Hydrocarbons	asphyxiant		% Range	None
Hydrogen	asphyxiant	4.0 %v	5 %vol	- 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	10 ppm	None
Hydrogen Sulfide	10 ppm	4.0 %v	200 ppm	None
Hydrogen Chloride	C 5 ppm	***	1.4 ppm	+ 1 ppm
Hydrogen Fluoride	C 3 ppm	***	0.8 ppm	+ 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blinking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A

SENSOR SPECIFICATIONS

SULFUR DIOXIDE

(0–20.0 ppm)

Part No. 182132-D-1

Minimum Indicated Concentration	0.7 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 5 seconds, (typical) T ₉₀ : < 15 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 30 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

SULFUR DIOXIDE

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	100 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	2 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	100 ppm	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	+ 1 ppm
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	2 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	0.8 ppm	+ 1 ppm
Nitric Oxide	25 ppm	***	35 ppm	- 1 ppm
Nitrogen Dioxide	3 ppm	***	0.9 ppm	- 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

APPENDIX A
SENSOR SPECIFICATIONS

SULFUR DIOXIDE (Filtered)

Interferent

APPENDIX A

SENSOR SPECIFICATIONS

SULFUR DIOXIDE [Filtered] (0–100 ppm) Part No. 181233-D-2X

Minimum Indicated Concentration	0.7 ppm
Repeatability	± 2% of reading
Accuracy *	± 2% of full scale
Zero Drift	< 5% change per year (typical)
Span Drift	< 10% change per year (typical)
Response Time (Rise)	T ₅₀ : < 5 seconds, (typical) T ₉₀ : < 20 seconds, successive exposures
Recovery Time (Fall)	T ₁₀ : < 30 seconds
Temperature Range	-20° to 50°C (-4° to 122°F)
Humidity Range (continuous)	5–95 %RH, non-condensing
Humidity Range (intermittent†)	0–99 %RH, non-condensing
Pressure Range	Ambient atmospheric, ± 1 psi
Recommended Calibration Flow Rate	1.0 LPM
Oxygen Requirement	1% by volume, minimum

† Gas exposure should not exceed eight (8) hours during any 24 hour period.

* When unit is calibrated and serviced at recommended intervals.

SULFUR DIOXIDE (Filtered)

Interferent	TLV	LEL	Exposure	Response
Carbon Monoxide	25 ppm	12.5 %v	60 ppm	+ 1 ppm
Chlorine	0.5 ppm	***	3 ppm	- 1 ppm
Ethylene	asphyxiant	3.1 %v	100 ppm	None
Hydrogen	asphyxiant	4.0 %v	100 ppm	None
Hydrogen Chloride	C 5 ppm	***	5 ppm	None
Hydrogen Cyanide	C 4.7 ppm	5.6 %v	2 ppm	+ 1 ppm
Hydrogen Sulfide	10 ppm	4.0 %v	15 ppm	None
Nitric Oxide	25 ppm	***	35 ppm	None
Nitrogen Dioxide	3 ppm	***	1 ppm	- 1 ppm

Interferent Notes

(***) means the substance is not combustible in air under normal conditions. "C" Denotes a ceiling (in TLV column).

If an interferent is present and there is no target gas, certain transmitters will not display the interferent response until the EFFECT of the interferent reaches ± 0.04 ppm. This is due to display "blanking" that occurs between - 0.03 ppm and + 0.03 ppm on transmitters that display gas concentrations with two digits after the decimal.

METHANE & PROPANE K-FACTORS FOR CATALYTIC SENSORS**Catalytic Bead Combustible Sensor**

The table below shows the variation in response for the Combustible Gas Sensor as K-factors (multipliers). These figures are experimentally derived and are expressed relative to Methane Propane.

Using the K-factor: Multiply the Methane or Propane %LEL challenge concentration by the respective K-factor to obtain the span value. Note that SensAlert® Sensors will not operate above 100 %LEL span.

Combustible Gas/Vapor	Methane K-factor	Propane K-factor
Methane	1.00	0.53
Acetaldehyde	1.80	0.95
Acetic acid	3.43	1.81
Acetic anhydride	1.97	1.04
Acetone	2.23	1.16
Acetonitrile	1.67	0.88
Acetylene	1.67	0.88
Ammonia	0.80	0.42
Aniline	2.93	2.93
Benzene	2.50	1.32
1,3-Butadiene	2.57	1.35
n-Butane	2.03	1.07
iso-Butane	1.83	0.96
1-Butene	2.13	1.12
cis-Butene-2	2.07	1.09
trans-Butene-2	1.90	1.00
n-Butyl alcohol	3.03	1.60
n-Butyric acid	2.43	1.28
Carbon disulphide	7.13	3.75
Carbon monoxide	1.27	0.67
Carbonyl sulphide	1.03	0.54
Chlorobenzene	2.93	1.54
Cyanogen	1.07	0.56
Cyclohexane	2.50	1.32
Cyclopropane	1.50	0.79

(table continued on next page)

IMPORTANT

Information about substances not listed in this table was unavailable at the time of this printing. Listed K-factors are not warranted, but can be used to estimate the %LEL concentration of substances from direct readings of Methane or Propane. K-factors can be used to obtain approximate direct readings of %LEL concentration of substances by calibration with Methane or Propane. Error varies from one sensor to another and with the age of the sensor assembly. The typical K-factor conversion error can be as high as 20–30%. In order to achieve the most accurate detection of a substance, calibration should be performed using a known %LEL concentration of the substance.

METHANE & PROPANE K-FACTORS FOR CATALYTIC SENSORS**Catalytic Bead Combustible Sensor**

The table below shows the variation in response for the Combustible Gas Sensor as K-factors (multipliers). These figures are experimentally derived and are expressed relative to Methane Propane.

Using the K-factor: Multiply the Methane or Propane %LEL challenge concentration by the respective K-factor to obtain the span value. Note that SensAlert® Sensors will not operate above 100 %LEL span.

Combustible Gas/Vapor	Methane K-factor	Propane K-factor
Methane	1.00	0.53
n-Decane	3.43	1.81
Diethyl ether	2.27	1.19
Diiso-propyl ether	2.33	1.23
Dimethyl ether	1.73	0.91
Dimethyl sulphide	2.33	1.23
Dimethylbutane	2.70	1.42
Dimethylhydrazine	1.43	0.75
Dimethylpentane	2.33	1.23
1,4 Dioxane	2.50	1.32
Ethane	1.40	0.74
Ethyl acetate	2.57	1.35
Ethyl alcohol	1.70	0.89
Ethyl bromide	0.93	0.49
Ethyl chloride	1.77	0.93
Ethyl formate	2.37	1.25
Ethyl mercaptan	1.77	0.93
Ethyl methyl ether	2.33	1.23
Ethylamine	1.40	0.74
Ethylbenzene	2.77	1.46
Ethylene	1.53	0.81
Ethylene dichloride	1.50	0.79
Ethylene oxide	2.33	1.23
Ethylpentane	2.37	1.25
Gasoline	2.23	1.18
n-Heptane	2.70	1.42

(table continued on next page)

IMPORTANT

Information about substances not listed in this table was unavailable at the time of this printing. Listed K-factors are not warranted, but can be used to estimate the %LEL concentration of substances from direct readings of Methane or Propane. K-factors can be used to obtain approximate direct readings of %LEL concentration of substances by calibration with Methane or Propane. Error varies from one sensor to another and with the age of the sensor assembly. The typical K-factor conversion error can be as high as 20–30%. In order to achieve the most accurate detection of a substance, calibration should be performed using a known %LEL concentration of the substance.

METHANE & PROPANE K-FACTORS FOR CATALYTIC SENSORS**Catalytic Bead Combustible Sensor**

The table below shows the variation in response for the Combustible Gas Sensor as K-factors (multipliers). These figures are experimentally derived and are expressed relative to Methane Propane.

Using the K-factor: Multiply the Methane or Propane %LEL challenge concentration by the respective K-factor to obtain the span value. Note that SensAlert® Sensors will not operate above 100 %LEL span.

Combustible Gas/Vapor	Methane K-factor	Propane K-factor
Methane	1.00	0.53
1,4-Hexadiene	1.50	0.79
n-Hexane	2.33	1.23
Hydrazine	1.97	1.04
Hydrogen	1.23	0.65
Hydrogen cyanide	2.00	1.05
Hydrogen sulfide	2.33	1.23
iso-Butyl alcohol	2.57	1.35
iso-Propyl alcohol	2.57	1.35
Isobutylene	1.97	1.04
Methyl acetate	2.17	1.14
Methyl alcohol	1.43	0.75
Methyl bromide	1.07	0.56
Methyl chloride	1.30	0.68
Methyl ethyl ketone	2.63	1.39
Methyl formate	1.87	0.98
Methyl mercaptan	1.60	0.84
Methyl propionate	2.07	1.09
Methyl propyl ketone	2.70	1.42
Methylamine	1.27	0.67
Methylcyclohexane	2.57	1.35
Methylene chloride	1.03	0.54
Methylhexane	2.37	1.25
Methylhydrazine	2.37	1.25
Methylpentane	2.70	1.42

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Using the K-factor: Multiply the Methane or Propane %LEL challenge concentration by the respective K-factor to obtain the span value. Note that SensAlert® Sensors will not operate above 100 %LEL span.

Combustible Gas/Vapor	Methane K-factor	Propane K-factor
Methane	1.00	0.53
Nitromethane	2.13	1.12
n-Nonane	4.00	2.11
n-Octane	2.87	1.51
n-Pentane	2.23	1.18
iso-Pentane	2.33	1.23
neo-Pentane	2.37	1.25
1-Pentene	2.33	1.23
Propane	1.90	1.00
Propene	1.87	0.98
n-Propyl alcohol	1.97	1.04
n-Propyl chloride	1.83	0.96
n-Propylamine	2.07	1.09
1,2-Propylene oxide	2.57	1.35
Propyne	2.33	1.23
tert-Butyl alcohol	1.80	0.95
Tetrahydrofuran	1.83	0.96
Toluene	2.50	1.32
Triethylamine	2.50	1.32
Trimethylamine	1.97	1.04
Trimethylbutane	2.27	1.19
Vinyl chloride	1.83	0.96
o-Xylene	3.03	1.59
m-Xylene	2.70	1.42
p-Xylene	2.77	1.46

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