### 3M<sup>™</sup> Meridian Sensor Specifications











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#### Combustible catalytic bead sensor

pΝ	096-3473-55		
Compatible Instruments	Meridian Universal Gas Detector		
Dongoot	Range	Resolution	Cal Gas
Ranges†	100% LEL	1% LEL	2.5% v/v CH4
A + - +	±3% LEL for conc < 50% LEL		
Accuracy/Linearity*	±5% LEL for conc ≥ 50% LEL		
Response Time*	t50 < 10 sec		
Response Time	t90 < 20 sec		
Operating Temperature	-40 to +75°C (-40 to +167°F)		
Operating Humidity	5-95% RH, non-condensing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9	in Hg)	
	Recommenda	ations	
calibration Gas	Target combustible gas (methane	default)	
Surrogate Calibration Gas	Methane or Propane		
Calibration Frequency	Quarterly		
Calibration Tubing	Tygon		
	‡A minimum of 10% oxygen is required for the sensor to operate properly		
Notes  *Sensor may be adversely affected by exposure to silicones, sulfur compounds, halogens or lead-containing compounds.			
	Commom k-factors (rela	ntive to methane)	

#### Common k-factors (relative to methane)

	Meria	ian combustib	le catalytic bead sensor		
	Con	nmon k-factor	s (relative to methane)		
K-Factor	k-factor	COMMON SYNONYMS	K-Factor	k-factor	COMMON SYNONYMS
Acetaldehyde ( $C_2H_4O$ )	0.64		Heptane (C <sub>7</sub> H <sub>16</sub> )	0.42	
Acetone ((CH <sub>3</sub> )2CO)	0.60		n-Hexane (C <sub>6</sub> H <sub>14</sub> )	0.40	
Acetylene (C <sub>2</sub> H <sub>2</sub> )	0.63		Hydrogen (H <sub>2</sub> )	0.81	
Ammonia (NH <sub>3</sub> )	1.43		Isopropyl Alcohol ((CH <sub>3</sub> )2CHOH)	0.44	Isopropanol, IPA
Benzene (C <sub>6</sub> H <sub>6</sub> )	0.45		Methane (CH <sub>4</sub> )	1.00	
1,3-Butadiene (C <sub>4</sub> H <sub>6</sub> )	0.45		Methyl Alcohol (CH <sub>3</sub> OH)	0.78	Methanol
n-Butane (C <sub>4</sub> H <sub>10</sub> )	0.52		Methylene Chloride (CH <sub>2</sub> Cl <sub>2</sub> )	1.11	
Isobutane (C <sub>4</sub> H <sub>10</sub> )	0.45		Methyl Chloride (CH <sub>3</sub> Cl)	0.88	
Isobutylene (C <sub>4</sub> H <sub>8</sub> )	0.58		Methyl Ethyl Ketone (C <sub>4</sub> H <sub>8</sub> O)	0.43	MEK
Butyl Acetate (C <sub>6</sub> H <sub>12</sub> O <sub>2</sub> )	0.40		n-Octane (C <sub>8</sub> H <sub>18</sub> )	0.32	
n-Butyl Alcohol (C <sub>4</sub> H <sub>9</sub> OH)	0.45	Butanol	Pentane (C <sub>5</sub> H <sub>12</sub> )	0.51	
Chlorobenzene (C <sub>6</sub> H <sub>5</sub> Cl)	0.38		Isopentane (C <sub>5</sub> H <sub>12</sub> )	0.46	
Cyclohexane (C <sub>6</sub> H <sub>12</sub> )	0.46		Propane (C <sub>3</sub> H <sub>8</sub> )	0.51	
Diethyl ether ((C <sub>2</sub> H <sub>5</sub> )2O)	0.50		Propylene (C <sub>3</sub> H <sub>6</sub> )	0.62	Propene
n-Decane (C <sub>10</sub> H <sub>22</sub> )	0.29		Propylene Oxide (C <sub>3</sub> H <sub>6</sub> O)	0.44	
Ethane (C <sub>2</sub> H <sub>6</sub> )	0.68		Styrene (C <sub>8</sub> H <sub>8</sub> )	0.43	
Ethyl Acetate (C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> )	0.46		Tetrahydrofuran ((CH <sub>2</sub> )4O)	0.47	THF
Ethyl Alcohol (CH <sub>3</sub> CH <sub>2</sub> OH)	0.63	Ethanol	Toluene (C <sub>7</sub> H <sub>8</sub> )	0.42	
Ethylbenzene (C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> CH <sub>3</sub> )	0.41		Vinyl Chloride (C <sub>2</sub> H <sub>3</sub> Cl)	0.56	VCM
Ethylene (C <sub>2</sub> H <sub>4</sub> )	0.63	Ethene	o-Xylene (C <sub>3</sub> H <sub>10</sub> )	0.38	Xylene, Xylene
Ethylene Oxide (C <sub>2</sub> H <sub>4</sub> O)	0.49				

#### K-factors may be used two ways:

for a sensor calibrated to read methane:
When a gas other than methane is known to be present, multiply the reading times the k-factor to get the concentration of the interfering gas.
To use methane to calibrate an instrument to read another gas:
Divide the methane cal gas concentration by the k-factor and span the instrument to that value.
Example: to span for methanol, apply 32% LEL methane and 32/0.78 = 41% LEL (menthanol)

# Ammonia (NH<sub>3</sub>) sensor

Notes

	Meridian ammonia (NH <sub>2</sub> ) se	ensor	
pN	096-3473-03		
Compatible Instruments	Meridian Universal Gas Detector		
	Range	Resolution	Cal Gas
	100 ppm (default)	1 ppm	50 ppm NH <sub>3</sub>
December	50 ppm	0.1 ppm	25 ppm NH <sub>3</sub>
Ranges <sup>†</sup>	250 ppm	1 ppm	50 ppm NH <sub>3</sub>
	300 ppm	1 ppm	300 ppm NH <sub>3</sub>
	500 ppm	1 ppm	300 ppm NH <sub>3</sub>
Accuracy/Linearity*	±2 ppm or 2% applied gas		
Daniel Time+	t50: < 30 sec		
Response Time*	t90: 3 min		
Ou susting Tanananatana	-5 to +50°C (23 to +122°F) continuous		
Operating Temperature	-40 to +50°C (-40 to +122°F) non-condensir	ng	
Operating Humidity	5-95% RH, non-condensing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)		
	Ratio	Interference Gas	
Occurred Interference Occur	0.7	Hydrazine	
Common Interference Gases	0.6	Hydrogen (H <sub>2</sub> )	
	0.5	MMH (monomethyl	hydrazine)
Ratio: 1 ppm of interference gas will	appear as the value shown on an NH sensor. Ot page 24 for additional cross-sensitivity in	her gases may influence sonformation.	ensor; refer to Appendix A on
	Recommendations		
calibration Gas	Ammonia (NH <sub>3</sub> )		
Surrogate Calibration Gas	None Recommended		
Calibration Frequency	Quarterly		
Calibration Tubing	Teflon or other fluorpolymer tubing		
Notes	*For a new sensor operating at 25°C, 50%R	H	
Notes			

†Sensor includes all listed ranges.

#### Bromine, high RH (RS BR2 HRH) Rock solid sensor

pΝ	096-3473-24			
Compatible Instruments	Meridian Universal Gas Detector			
	Range	Resolution	Cal Gas	
Ranges†	10 ppm default	0.01 ppm	5 ppm Cl <sub>2</sub>	
	1 ppm	0.01 ppm	2 ppm Cl <sub>2</sub> ‡	
Accuracy/Linearity*	±0.5 ppm or 3% of applied	d gas		
D T' +	t50 ≤ 5 sec			
Response Time*	t90 ≤ 60 sec			
Operating Temperature	-40 to +50°C (-40 to +122°F) non-condensing			
Operating Humidity §	5-95% RH, non-condensing			
Operating Pressure	100 kPa ± 20 kPa (29.5 in	Hg ± 5.9 in Hg)		
	1	Chlorine (Cl <sub>2</sub> )		
	0.4	Chlorine Dioxide (CIO <sub>2</sub> )		
	0.9	Fluorine (F <sub>2</sub> )		
Common Interference Gases	< 0.1	Hydrogen Chloride (HCl)		
	< 0.1	Ozone (O <sub>3</sub> )		
	< 0.01	Sulfur Dioxide (SO <sub>2</sub> )		
	< 0.01	Sulfur Dioxide (SO <sub>2</sub> )		

Ratio: 1 ppm of interference gas will appear as the value shown on a RS  $Br_2$  sensor. Other gases may influence sensor; refer to Appendix A on page 24 for additional cross-sensitivity information.

	RECOMMENDATIONS			
Calibration Gas	Bromine (Br <sub>2</sub> )			
Surrogate Calibration Gas	Chlorine (Cl <sub>2</sub> ) Span sensor to Cl <sub>2</sub> cal gas concentration			
Calibration Frequency	Quarterly			
Calibration Tubing	Teflon or other fluorpolymer tubing			
	*For a new sensor operating at 25°C, 50%RH			
	†Sensor includes all listed ranges.			
Notes	‡Use Range-Invariant Calibration feature if < 1 ppm Cl <sub>2</sub> calibration gas is unavailable.			
	§This sensor is optimized for best performance and longevity in relatively humid conditions. Recommend 70% RH ± 15%.			

# Carbon Dioxide (CO<sub>2</sub>) Infrared (IR) sensor

	Meridian carbon dioxide (CO <sub>2</sub> ) infrar	ed (IR) sensor	
pΝ	096-3473-58		
Compatible Instruments	Meridian Universal Gas Detector		
Dammas+	Range	Resolution	Cal Gas
Ranges†	5% V/V	0.01% V/V	2.5% V/V CO <sub>2</sub>
Accuracy/Linearity*	±0.25% V/V		
D Tim +	t50 < 10 sec		
Response Time*	t90 < 30 sec		
Operating Temperature	-40 to +75°C (-40 to +167°F)		
Operating Humidity	5-95% RH, non-condensing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)		
	Recommendations		
calibration Gas	Carbon Dioxide (CO <sub>2</sub> )		
Surrogate Calibration Gas	None Recommended		
Calibration Frequency	Twice per year		
Calibration Tubing	Tygon		
Notes	*For a new sensor operating at 25°C, 50%RI	<del></del>	

#### Carbon Monoxide (CO) Sensor

pΝ	096-3473-01		
Compatible Instruments	Meridian Universal Gas Detector		
Compatible instruments		Danalustina	0-10
	Range	Resolution	Cal Gas
	100 ppm (default)	1 ppm	50 ppm CO
Ranges†	50 ppm	0.1 ppm	25 ppm CO
Kanges.	150 ppm	1 ppm	100 ppm CO
	500 ppm	1 ppm	250 ppm CO
	1000 ppm	1 ppm	500 ppm CO
Accuracy/Linearity*	±5% of applied gas, or better		
D	t50: < 5 sec		
Response Time*	t90: < 15 sec		
Operating Temperature	-40 to +50°C (-40 to +122°F)		
Operating Humidity	5-95% RH, non-condensing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)		
	Ratio	Interference Gas	
	0.2	Hydrogen (H <sub>2</sub> )	
	0	Hydrogen Sulfide (H <sub>2</sub> S)	
Common Interference Gases	0	Isopropanol (IPA) ((CH <sub>3</sub> ) <sub>2</sub> CHOH)	
	0.5	Methanol (CH <sub>3</sub> OH)	
	0	Methyl Mercaptan (CH <sub>3</sub> SH)	
	0	Sulfur Dioxide (SO <sub>2</sub> )	·

Ratio: 1 ppm of interference gas will appear as the value shown on a CO sensor. Other gases may influence sensor; refer to Appendix A on page 24 for additional cross-sensitivity information.

Recommendations			
Calibration Gas	Carbon Monoxide (CO)		
Surrogate Calibration Gas	None Recommended		
Calibration Frequency	Quarterly		
Calibration Tubing	Tygon		
Notes	*For a new sensor operating at 25°C, 50%RH		
	†Sensor includes all listed ranges.		

#### Chlorine, high RH (RS CL<sub>2</sub> HRH) rock solid sensor

pΝ	096-3473-20			
Compatible Instruments	Meridian Universal Gas Detector			
	Range	Resolution	Cal Gas	
	5 ppm default	0.01 ppm	2 ppm Cl <sub>2</sub>	
	1 ppm	0.01 ppm	2 ppm Cl <sub>2</sub> ‡	
Ranges†	3 ppm	0.01 ppm	$2 \text{ ppm Cl}_2$	
	10 ppm	0.1 ppm	5 ppm Cl <sub>2</sub>	
	20 ppm	0.1 ppm	10 ppm Cl <sub>2</sub>	
	30 ppm	0.1 ppm	10 ppm Cl <sub>2</sub>	
Accuracy/Linearity*	±0.5 ppm or 3% of applied gas			
D Ti +	t50 ≤ 5 sec			
Response Time*	t90 ≤ 60 sec			
Operating Temperature	-40 to +50°C (-40 to +122°F)			
Operating Humidity §	5-95% RH, non-condensin	g		
Operating Pressure	100 kPa ± 20 kPa (29.5 in I	Hg ± 5.9 in Hg)		
	Ratio	Interference Gas		
	1	Bromine (Br <sub>2</sub> )		
	0.4	Chlorine Dioxide (CIO <sub>2</sub> )		
Common Interference Gases	0.9	Fluorine (F <sub>2</sub> )		
	< 0.1	Hydrogen chloride (HCI)	<u> </u>	
	< 0.1	Ozone (O <sub>3</sub> )		
	< 0.01	Sulfur Dioxide (SO <sub>2</sub> )		

Ratio: 1 ppm of interference gas will appear as the value shown on a RS  $\text{Cl}_2$  sensor. Other gases may influence sensor; refer to Appendix A on page 24 for additional cross-sensitivity information.

Recommendations			
Calibration Gas	Chlorine (Cl <sub>2</sub> )		
Surrogate Calibration Gas	None Recommended		
Calibration Frequency Quarterly			
Calibration Tubing	Teflon or other fluorpolymer tubing		
	*For a new sensor operating at 25°C, 50%RH		
	†Sensor includes all listed ranges.		
Notes	‡Use Range-Invariant Calibration feature if < 1 ppm Cl <sub>2</sub> calibration gas is unavailable.		
	§This sensor is optimized for best performance and longevity in relatively humid		

 $\S$ This sensor is optimized for best performance and longevity in relatively humid conditions. Recommend 70% RH  $\pm$  15%.

### Chlorine, low RH (RS CL<sub>2</sub> LRH) rock solid sensor

Me	eridian chlorine, low RH	(RS CL <sub>2</sub> LRH) rock solid	d sensor	
pN	096-3473-21			
Compatible Instruments	Meridian Universal Gas D	etector		
	Range	Resolution	Cal Gas	
	5 ppm default	0.01 ppm	2 ppm Cl <sub>2</sub>	
	1 ppm	0.01 ppm	2 ppm Cl <sub>2</sub> ‡	
Ranges†	3 ppm	0.01 ppm	2 ppm Cl <sub>2</sub>	
	10 ppm	0.1 ppm	5 ppm Cl <sub>2</sub>	
	20 ppm	0.1 ppm	10 ppm Cl <sub>2</sub>	
	30 ppm	0.1 ppm	10 ppm Cl <sub>2</sub>	
Accuracy/Linearity*	±0.5 ppm or 3% of applie	d gas		
Description of	t50 ≤ 5 sec			
Response Time*	t90 ≤ 60 sec			
Operating Temperature	-40 to +50°C (-40 to +122°F) non-condensing			
Operating Humidity §	5-95% RH, non-condensing			
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)			
	Ratio	Interference Gas		
	1	Bromine (Br <sub>2</sub> )		
	0.4	Chlorine Dioxide (CIO	2)	
Common Interference Gases	0.9	Fluorine (F <sub>2</sub> )		
	< 0.1	Hydrogen Chloride (H	CI)	
	< 0.1	Ozone (O <sub>3</sub> )		
	< 0.01	Sulfur Dioxide (SO <sub>2</sub> )		
Ratio: 1 ppm of interference gas will ap 24 for additional cross-sensitivity info	pear as the value shown on a R mation.	S Cl <sub>2</sub> sensor. Other gases may	influence sensor; refer to Appendix A on page	
	Recom	mendations		
Calibration Gas	Chlorine (Cl <sub>2</sub> )			
Surrogate Calibration Gas	None Recommended			
Calibration Frequency	Quarterly			
Calibration Tubing	Teflon or other fluorpolyn	ner tubing		
	*For a new sensor operating at 25°C, 50%RH			
	†Sensor includes all listed ranges.			
Notes	$\pm$ Use Range-Invariant Calibration feature if < 1 ppm Cl $_2$ calibration gas is unavailable.			
	§This sensor is optimized conditions. Recommend §	for best performance and long 50% RH ± 15%.	evity in relatively dry	

#### Fluorine, high RH (RS F<sub>2</sub> HRH) rock solid sensor

PN	096-3473-22		
Compatible Instruments	Meridian Universal Gas D	etector	
	Range	Resolution	Cal Gas
Don woot	5 ppm default	0.01 ppm	2 ppm Cl <sub>2</sub>
Ranges†	1 ppm	0.01 ppm	2 ppm Cl <sub>2</sub> ‡
	3 ppm	0.01 ppm	2 ppm Cl <sub>2</sub>
Accuracy/Linearity*	±0.5 ppm or 3% of applie	d gas	
Response Time*	t50 ≤ 5 sec		
	t90 ≤ 60 sec		
Operating Temperature	-40 to +50°C (-40 to +122°F) non-condensing		
Operating Humidity §	5-95% RH, non-condensing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)		
	Ratio	Interference Gas	
	1.1	Bromine (Br <sub>2</sub> )	
	1.1	Chlorine (Cl <sub>2</sub> )	
mmon Interference Gases	0.4	Chlorine Dioxide (CIO <sub>2</sub> )	
	< 0.1	Hydrogen Chloride (HCI)	
	< 0.1	Ozone (O <sub>3</sub> )	
	< 0.01	Sulfur Dioxide (SO <sub>2</sub> )	

Ratio: 1 ppm of interference gas will appear as the value shown on a RS  $F_2$  sensor. Other gases may influence sensor; refer to Appendix A on page 24 for additional cross-sensitivity information.

calibration Gas	Fluorine (F <sub>2</sub> )	
rrogate Calibration Gas	Chlorine (Cl <sub>2</sub> ) Span sensor to 1.1 × Cl <sub>2</sub> cal gas concentration	
Calibration Frequency	Quarterly	
Calibration Tubing	Teflon or other fluorpolymer tubing	
	*For a new sensor operating at 25°C, 50%RH	
	†Sensor includes all listed ranges.	
Notes	‡Use Range-Invariant Calibration feature if < 1 ppm Cl <sub>2</sub> calibration gas is unavailable.	
	§This sensor is optimized for best performance and longevity in relatively humid conditions. Recommend 70% RH ± 15%.	

#### Fluorine, low RH (RS F<sub>2</sub> LRH) rock solid sensor

pΝ	096-3473-23		
Compatible Instruments	Meridian Universal Gas D	etector	
	Range	Resolution	Cal Gas
D +	1 ppm default	0.01 ppm	2 ppm Cl <sub>2</sub> ‡
Ranges†	3 ppm	0.01 ppm	2 ppm Cl <sub>2</sub>
	5 ppm	0.01 ppm	2 ppm Cl <sub>2</sub>
Accuracy/Linearity*	±0.5 ppm or 3% of applied	d gas	
Response Time*	t50 ≤ 5 sec		
	t90 ≤ 60 sec		
Operating Temperature	-40 to +50°C (-40 to +122°F) non-condensing		
Operating Humidity §	5-95% RH, non-condensing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in	Hg ± 5.9 in Hg)	
	Ratio	Interference Gas	
	1.1	Bromine (Br <sub>2</sub> )	
	1.1	Chlorine (Cl <sub>2</sub> )	
Common Interference Gases	0.4	Chlorine Dioxide (CIO <sub>2</sub> )	
	< 0.1	Hydrogen Chloride (HCI)	
	< 0.1	Ozone (O <sub>3</sub> )	
	< 0.01	Sulfur Dioxide (SO <sub>2</sub> )	

Ratio: 1 ppm of interference gas will appear as the value shown on a RS  $F_2$  sensor. Other gases may influence sensor; refer to Appendix A on page 24 for additional cross-sensitivity information.

Recommendations		
calibration Gas	Fluorine (F <sub>2</sub> )	
Surrogate Calibration Gas	Chlorine $(Cl_2)$ Span sensor to 1.1 × $Cl_2$ cal gas concentration	
Calibration Frequency	Quarterly	
Calibration Tubing	Teflon or other fluorpolymer tubing	
	*For a new sensor operating at 25°C, 50%RH	
	†Sensor includes all listed ranges.	
Notes	‡Use Range-Invariant Calibration feature if < 1 ppm Cl <sub>2</sub> calibration gas is unavailable.	
	§This sensor is optimized for best performance and longevity in relatively dry conditions. Recommend 50% RH ± 15%.	

#### Hydrogen Chloride, High RH (RS HCL HRH) Rock solid sensor

pΝ	096-3473-25		
Compatible Instruments	Meridian Universal Gas D	etector	
	Range	Resolution	Cal Gas
D +	10 ppm default	0.1 ppm	5 ppm SO <sub>2</sub>
Ranges†	1 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡
	25 ppm	0.1 ppm	9 ppm SO <sub>2</sub>
Accuracy/Linearity*	±4% of applied gas		
D	t50 < 20 sec		
Response Time*	t90 < 60 sec		
On anotin m Taman anatuma	-20 to +50°C (-4 to +122	°F) continuous	
Operating Temperature	-40 to +50°C (-40 to +12	2°F) non-condensing	
Operating Humidity §	5-95% RH, non-condensing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in	Hg ± 5.9 in Hg)	
	Ratio	Interference Gas	
	1.3	Chlorine (Cl <sub>2</sub> )	
	0.4	Chlorine Dioxide (CIO <sub>2</sub> )	
Common Interference Gases	1.6	Fluorine (F <sub>2</sub> )	
ommon interference Gases	1	Hydrogen Fluoride (HF)	
	< 0.5	Hydrogen Sulfide (H <sub>2</sub> S)	
	< 0.1	Ozone (O <sub>3</sub> )	
	1.3	Sulfur Dioxide (SO <sub>2</sub> )	

Ratio: 1 ppm of interference gas will appear as the value shown on a RS HCl sensor. Other gases may influence sensor; refer to Appendix A on page 24 for additional cross-sensitivity information.

Recommendations		
calibration Gas	Hydrogen Chloride (HCI)	
Surrogate Calibration Gas¶	Sulfur Dioxide (SO <sub>2</sub> ) Span sensor to 1.3 × SO <sub>2</sub> cal gas concentration	
Calibration Frequency	Quarterly	
Calibration Tubing	Tygon for SO <sub>2</sub> ; Teflon or other fluorpolymer tubing for HCI	
	*For a new sensor operating at 25°C, 50%RH	
Notes	†Sensor includes all listed ranges.	
	$\pm$ Use Range-Invariant Calibration feature if < 1 ppm HCl or SO $_2$ calibration gas is unavailable.	
	§This sensor is optimized for best performance and longevity in relatively humid conditions. Recommend 70% RH ± 15%.	

 $\P{Cl}_2$  may be used to adjust the sensor output but must be followed with an acid-gas bump to ensure proper function. Acceptable bump gases include: HF, HCl,  $SO_2$ , acetic acid (vinegar).

#### Hydrogen Chloride, Low RH (RS HCL LRH) Rock solid sensor

pΝ	096-3473-26			
Compatible Instruments	Meridian Universal Gas [	Detector		
·	Range	Resolution	Cal Gas	
	10 ppm default	0.1 ppm	5 ppm SO <sub>2</sub>	
Ranges†	1 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡	
	25 ppm	0.1 ppm	9 ppm SO <sub>2</sub>	
Accuracy/Linearity*	±4% of applied gas		<u>-</u>	
	t50 < 20 sec			
Response Time*	t90 < 60 sec			
	-20 to +50°C (-4 to +122	2°F) continuous		
Operating Temperature	-40 to +50°C (-40 to +12	22°F) non-condensing		
Operating Humidity §	5-95% RH, non-condens	ing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)			
-	Ratio	Interference Gas		
	1.3	Chlorine (Cl <sub>o</sub> )		
	0.4	Chlorine Dioxide (CIO	,)	
	1.6	Fluorine (F <sub>2</sub> )	z <sup>.</sup>	
Common Interference Gases	1	Hydrogen Fluoride (H	F)	
	< 0.5	Hydrogen Sulfide (H <sub>2</sub> S		
	< 0.1	Ozone (O <sub>2</sub> )		
	1.3	Sulfur Dioxide (SO <sub>2</sub> )		
Ratio: 1 ppm of interference gas will a	appear as the value shown on page 24 for additiona	a RS HCl sensor. Other gases r I cross-sensitivity information.	nay influence sensor; refer to Appendix A or	
	Recor	nmendations		
calibration Gas	Hydrogen Chloride (HCI)			
Surrogate Calibration Gas¶	Sulfur Dioxide (SO <sub>2</sub> ) Spar	n sensor to 1.3 × SO <sub>2</sub> cal gas co	ncentration	
Calibration Frequency	Quarterly			
Calibration Tubing	Tygon for SO <sub>2</sub> ; Teflon or	other fluorpolymer tubing for H	ICI	
	*For a new sensor operating at 25°C, 50%RH			
	†Sensor includes all listed ranges.			
	‡Use Range-Invariant Calibration feature if < 1 ppm HCl or SO <sub>2</sub> calibration gas is unavailable.			
Notes	§This sensor is optimized for best performance and longevity in relatively dry conditions. Recommend 50% RH ± 15%.			
	¶Cl, may be used to adjust the sensor output but must be followed with an acid-gas bump to ensure proper function. Acceptable bump gases include: HF, HCl, SO <sub>2</sub> , acetic acid (vinegar).			

#### Hydrogen Fluoride, high RH (RS HF HRH) Rock solid sensor

pΝ	096-3473-27		
Compatible Instruments	Meridian Universal Gas D	Petector	
	Range	Resolution	Cal Gas
	10 ppm default	0.1 ppm	5 ppm SO <sub>2</sub>
Ranges†	1 ppm	0.01 ppm	5 ppm SO <sub>o</sub> ‡
	5 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡
	30 ppm	0.1 ppm	9 ppm SO <sub>2</sub>
Accuracy/Linearity*	±4% of applied gas		
	t50 < 20 sec		
Response Time*	t90 < 60 sec		
	-20 to +50°C (-4 to +122	°F) continuous	
Operating Temperature	-40 to +50°C (-40 to +12		
Operating Humidity §	5-95% RH, non-condensi	ng	
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)		
	Ratio	Interference Gas	
	1.3	Chlorine (Cl <sub>2</sub> )	
	0.4	Chlorine Dioxide (CIO	)
	1.6	Fluorine (F <sub>2</sub> )	
Common Interference Gases	1	Hydrogen Fluoride (HF	-)
	< 0.5	Hydrogen Sulfide (H <sub>2</sub> S	)
	< 0.1	Ozone (O <sub>3</sub> )	
	1.3	Sulfur Dioxide (SO <sub>2</sub> )	
Ratio: 1 ppm of interference gas will	appear as the value shown on page 24 for additiona	a RS HF sensor. Other gases m I cross-sensitivity information.	ay influence sensor; refer to Appendix A o
	Recon	nmendations	
calibration Gas	Hydrogen Chloride (HCI)		
Commonata Calibratian Can	Sulfur dioxide (SO <sub>2</sub> ) Span	sensor to 1.3 × SO <sub>2</sub> cal gas con	centration
Surrogate Calibration Gas¶	Hydrogen Chloride (HCI)	Span sensor to HCl cal gas cor	ncentration
Calibration Frequency	Quarterly		
Calibration Tubing	Tygon for SO <sub>2</sub> ; Teflon or	other fluorpolymer tubing for H	CI
	*For a new sensor operating at 25°C, 50%RH		
	†Sensor includes all listed ranges.		
Notes	‡Use Range-Invariant Calibration feature if < 1 ppm HF, HCl or SO <sub>2</sub> calibration gas is unavailable.		
Notes	§This sensor is optimized for best performance and longevity in relatively humid conditions. Recommend 70% RH ± 15%.		
	¶Cl <sub>2</sub> may be used to adjust the sensor output but must be followed with an acid-gas bump to ensure proper function. Acceptable bump gases include: HF, HCl, SO <sub>2</sub> , acetic acid (vinegar).		

#### Hydrogen Fluoride, low RH (RS HF LRH) Rock solid sensor

Meridia	an hydrogen fluoride, l	ow RH (RS HF LRH) rock	k solid sensor	
pΝ	096-3473-28			
Compatible Instruments	Meridian Universal Gas [	Detector		
	Range	Resolution	Cal Gas	
	10 ppm default	0.1 ppm	5 ppm SO <sub>2</sub>	
Ranges†	1 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡	
	5 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡	
	30 ppm	0.1 ppm	9 ppm $SO_2$	
Accuracy/Linearity*	±4% of applied gas			
Danie a Time a*	t50 < 20 sec			
Response Time*	t90 < 60 sec			
O	-20 to +50°C (-4 to +122	2ºF) continuous		
Operating Temperature	-40 to +50°C (-40 to +1	22°F) non-condensing		
Operating Humidity §	5-95% RH, non-condensing			
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)			
	Ratio	Interference Gas		
	1.3	Chlorine (Cl <sub>2</sub> )		
	0.4	0.4 Chlorine Dioxide (CIO <sub>2</sub> )		
0	1.6	1.6 Fluorine (F <sub>2</sub> )		
Common Interference Gases	1	Hydrogen Chloride (H	ICI)	
	< 0.5	Hydrogen Sulfide (H <sub>2</sub> S)		
	< 0.1	Ozone (O <sub>3</sub> )		
	1.3	Sulfur Dioxide (SO <sub>2</sub> )		
Ratio: 1 ppm of interference gas will	appear as the value shown or page 24 for additiona	a RS HF sensor. Other gases n Il cross-sensitivity information.	nay influence sensor; refer to Appendix A o	
	Recor	nmendations		
calibration Gas	Hydrogen Fluoride (HF)			
	Sulfur Dioxide (SO <sub>2</sub> ) Spa	n sensor to 1.3 × SO, cal gas co	oncentration	
Surrogate Calibration Gas¶	Hydrogen Chloride (HCI	) Span sensor to HCl cal gas co	oncentration	
Calibration Frequency	Quarterly			
Calibration Tubing	Tygon for SO <sub>2</sub> ; Teflon or	other fluorpolymer tubing for I	HCI	
	*For a new sensor operating at 25°C, 50%RH			
	†Sensor includes all listed ranges.			
Natao	‡Use Range-Invariant Calibration feature if < 1 ppm HF, HCl or SO <sub>2</sub> calibration gas is unavailable.			
Notes	§This sensor is optimized for best performance and longevity in relatively dry conditions. Recommend 50% RH ± 15%.			
	¶Cl <sub>2</sub> may be used to adjust the sensor output but must be followed with an acid-gas bump to ensure proper function. Acceptable bump gases include: HF, HCl, SO <sub>2</sub> , acetic acid (vinegar).			

#### Hydrogen sulfide (low methanol) (H<sub>2</sub>S-LM) sensor

pΝ	096-3473-02			
Compatible Instruments	Meridian Universal Gas Detector			
	Range	Resolution	Cal Gas	
	50 ppm (default)	0.1 ppm	25 ppm H <sub>2</sub> S	
Ranges†	10 ppm	0.1 ppm	10 ppm H <sub>2</sub> S	
	25 ppm	0.1 ppm	10 ppm H <sub>2</sub> S	
	100 ppm	1 ppm	50 ppm H <sub>2</sub> S	
Accuracy/Linearity*	±1% of applied gas, or better			
Response Time*	t50: < 15 sec			
Response Time"	t90: < 45 sec			
Operating Temperature	-40 to +50°C (-40 to +122°F)	-40 to +50°C (-40 to +122°F)		
Operating Humidity	5-95% RH, non-condensing			
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)			
	Ratio Interference Gas			
	0 Carbon Monoxide (CO)			
	0 Hydrogen (H <sub>2</sub> )			
Common Interference Gases	0 Isopropanol (IPA) ((CH <sub>3</sub> )2CHOH		CH <sub>3</sub> )2CHOH)	
	0	Methanol (CH <sub>3</sub> OH)		
	0	Methyl Mercaptan	(CH <sub>3</sub> SH)	
	< 0.2	< 0.2 Sulfur Dioxide (SO <sub>2</sub> )		
Ratio: 1 ppm of interfer sensor;	rence gas will appear as the value shown on refer to Appendix A on page 24 for addition	an H.S-LM sensor. Other gase nal cross-sensitivity information	es may influence n.	
	Recommendation	ns		
calibration Gas	Hydrogen Sulfide (H <sub>2</sub> S)			
Surrogate Calibration Gas	None Recommended			
Calibration Frequency	Quarterly			
Calibration Tubing	Tygon			
N-+	*For a new sensor operating at 25°C, 5	60%RH		
Notes	†Sensor includes all listed ranges.			

# Oxygen (O<sub>2</sub>) Sensor

	Meridian oxyger	(O <sub>2</sub> ) sensor	
pΝ	096-3473-19		
Compatible Instruments	Meridian Universal Gas Detector		
	Range	Resolution	Cal Gas
Ranges†	25% V/V (default)	0.1% V/V	20.9% O <sub>2</sub> and 100% N <sub>2</sub>
	10% V/V	0.1% V/V	20.9% O <sub>2</sub> ‡ and 100% N
Accuracy/Linearity*	0.25% V/V		
D	t50: < 5 sec		
Response Time*	t90: < 20 sec		
Operating Temperature	-30 to +50°C (-22 to +122°F)		
Operating Humidity	5-95% RH, non-condensing		
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.	9 in Hg)	
	Recommen	dations	
calibration Gas	Nitrogen (N <sub>2</sub> ) and Air		
Surrogate Calibration Gas	None Recommended		
Calibration Frequency	Monthly		
Calibration Tubing	Tygon		
	*For a new sensor operating at 29	5°C, 50%RH	
Notes	†Sensor includes all listed ranges		
	‡Use Range-Invariant Calibration feature if <10% O <sub>2</sub> calibration gas is unavailable.		

#### Sulfur Dioxide, high RH (RS SO<sub>2</sub> HRH) Rock Solid sensor

Merid	ian sulfur dioxide, high	RH (RS SO <sub>2</sub> HRH) rock s	solid sensor
pΝ	096-3473-31		
Compatible Instruments	Meridian Universal Gas [	Detector	
	Range	Resolution	Cal Gas
	10 ppm default	0.1 ppm	$5\mathrm{ppmSO}_2$
Ranges†	1 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡
	3 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡
	25 ppm	0.1 ppm	9 ppm $SO_2$
Accuracy/Linearity*	±5% reading		
Response Time*	t50 < 5 sec		
Response Time	t90 < 75 sec		
Operating Temperature	-20 to +50°C (-4 to +122	2°F) continuous	
Operating reinperature	-40 to +50°C (-40 to +12	22°F) non-condensing	
Operating Humidity §	5-95% RH, non-condens	ing	
Operating Pressure	100 kPa ± 20 kPa (29.5 in Hg ± 5.9 in Hg)		
	Ratio	Interference Gas	
	1.6	Chlorine (Cl <sub>2</sub> )	
	0.5	Chlorine Dioxide (CIO	2)
Common Interference Gases	1.5	Fluorine (F <sub>2</sub> )	
Common interrerence dases	0.8	Hydrogen Chloride (H	CI)
	0.8	Hydrogen Fluoride (HF	=)
	< 0.5	Hydrogen Sulfide (H <sub>2</sub> S	r)
	< 0.1	Ozone (O <sub>3</sub> )	
Ratio: 1 ppm of interference gas will a	ppear as the value shown on page 24 for addition	a RS SO <sub>2</sub> sensor. Other gases n al cross-sensitivity information	nay influence sensor; refer to Appendix A or
	Recor	nmendations	
calibration Gas	Sulfur Dioxide (SO <sub>2</sub> )		
Surrogate Calibration Gas	None Recommended		
Calibration Frequency	Quarterly		
Calibration Tubing	Tygon		
	*For a new sensor opera	ting at 25°C, 50%RH	
	†Sensor includes all listed	d ranges.	
Notes	‡Use Range-Invariant Ca unavailable.	libration feature if < 3 ppm SO <sub>2</sub>	calibration gas is
	§This sensor is optimized conditions. Recommend	I for best performance and long 70% RH ± 15%.	evity in relatively humid

#### Sulfur dioxide, low RH (RS SO<sub>2</sub> LRH) Rock solid sensor

Merio	lian sulfur dioxide, low	RH (RS SO <sub>2</sub> LRH) rock s	olid sensor			
pΝ	096-3473-32					
Compatible Instruments	Meridian Universal Gas D	etector				
	Range	Resolution	Cal Gas			
	10 ppm default	0.1 ppm	$5~{\rm ppm~SO_2}$			
Ranges†	1 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡			
	3 ppm	0.01 ppm	5 ppm SO <sub>2</sub> ‡			
	25 ppm	0.1 ppm	9 ppm SO <sub>2</sub>			
Accuracy/Linearity*	±5% reading					
Daniana Tima*	t50 < 5 sec					
Response Time*	t90 < 75 sec					
On and in a Target and the	-20 to +50°C (-4 to +122	°F) continuous				
Operating Temperature	-40 to +50°C (-40 to +12	22°F) non-condensing				
Operating Humidity §	5-95% RH, non-condens	ing				
Operating Pressure	100 kPa ± 20 kPa (29.5 ir	n Hg ± 5.9 in Hg)				
	Ratio	Ratio Interference Gas				
	1.6	l.6 Chlorine (Cl <sub>2</sub> )				
	0.5	Chlorine Dioxide (CIO <sub>2</sub> )				
0	1.5	1.5 Fluorine (F <sub>2</sub> )				
Common Interference Gases	0.8	0.8 Hydrogen Chloride (HCI)				
	0.8	0.8 Hydrogen Fluoride (HF)				
	< 0.5	< 0.5 Hydrogen Sulfide (H <sub>2</sub> S)				
	< 0.1	< 0.1 Ozone (O <sub>3</sub> )				
Ratio: 1 ppm of interference gas will a	ppear as the value shown on page 24 for additiona	a RS SO <sub>2</sub> sensor. Other gases n I cross-sensitivity information.	nay influence sensor; refer to Appendix A or			
	Recon	nmendations				
calibration Gas	Sulfur Dioxide (SO <sub>2</sub> )					
Surrogate Calibration Gas	None Recommended					
Calibration Frequency	Quarterly					
Calibration Tubing	Tygon					
	*For a new sensor operating at 25°C, 50%RH					
	†Sensor includes all listed ranges.					
Notes	$\stackrel{+}{\text{Use}}$ Range-Invariant Calibration feature if < 3 ppm $\mathrm{SO}_2$ calibration gas is unavailable.					
	§This sensor is optimized for best performance and longevity in relatively dry conditions. Recommend 50% RH ± 15%.					

# NOTES: Meridian

#### Guidelines for using the Meridian interference table

- The gas interference table does not show, nor should it be implied that no additional
  intereferences may occur. These selectivity ratios are used as guides only. The gas species' actual crosssensitivities may vary from the values shown.
- It is always best practice to use the target gas to calibrate any sensor. In some cases,
  however, the target gas is not practically available in a known or stable concentration. In these instances, a
  surrogate calibration gas may be used. Selectivity ratios for acceptable surrogates are indicated with grey cell
  highlights.
- For each sensor type, the table shows how 1 ppm of an Interference Gas appears on that specific sensor type. For example, 1 ppm chlorine dioxide (CIO<sub>2</sub>) will appear as 0.4 ppm chlorine on a Rock Solid Cl<sub>2</sub> sensor (096-3473-20 or 096-3473-21).

Key for table							
Zero	Indicates tested and confirmed no interferences						
Blank	Indicates not tested						
Neg	Indicates gas produces a negative signal but a stable Ratio has not been defined						
Yes	Indicates gas produces a positive signal but a stable Ratio has not been defined						
Two values in a cell	Indicates initial peak (in parentheses) and final offset						
Dark grey highlight	Indicates target calibration gas or acceptable Surrogate calibration gas						

#### Meridian sensor interference table

SENSORS

						SENSORS				
SENSORS	Meridian Sensor: Part Number: Target Gas:	Ammonia (NH <sub>3</sub> ) 096-3473-03	Rock Solid Br <sub>2</sub> Hi RH (NH <sub>3</sub> ) 096-3473-24 Bromine (Br <sub>3</sub> )	Carbon Monoxide (CO) 096-3473-01 Carbon Monoxide (CO)	Rock Solid Cl., Hi RH Rock Solid Cl., Lo RH 096-3473-20 096-3473-21 Chlorine (Cl.)	Rock Solid F <sub>2</sub> , Hi RH Rock Solid F <sub>2</sub> , Lo RH 096-3473-22 096-3473-23 Fluorine (F <sub>3</sub> )	Rock Solid HCI, Hi RH Rock Solid HCI, Lo RH 096-3473-25 096-3473-26 Hydrogen Chloride (HCI)	Rock Solid HF, Hi RH Rock Solid HF, Lo RH 096-3473-27 096-3473-28 Hydrogen Fluoride (HF)	H <sub>2</sub> S Low Methanol 096-3473-02 Hydrogen Sulfide (H <sub>2</sub> S)	Rock Solid SO <sub>2</sub> , Hi RH Rock Solid SO <sub>2</sub> , Lo RH 096-3473-31 096-3473-32 Sulfur Dioxide (SO <sub>2</sub> )
GASES	Acetylene (C <sub>2</sub> H <sub>2</sub> )	(0.07) 0.04		0.3					0	
	Ammonia (NH <sub>3</sub> )		0	0	0	0			0	
	Arsine (AsH <sub>3</sub> )	(2.7) 1.6		0					0.8	
	Boron Trichloride (BCl <sub>3</sub> )						0.5	0.5		0.4
	Boron Trifluoride (BF <sub>3</sub> )						0.4	0.4		0.3
	Bromine (Br <sub>2</sub> )	NEG			1	1.1	YES	YES		YES
	Carbon Monoxide (CO)	0.4							0	_
	Chlorine (Cl <sub>2</sub> )	(-0.2) -0.09		0			1.3	1.3	-0.2	1.7
	Chlorine Dioxide (CIO <sub>2</sub> )		0.4		0.4	0.4	0.4	0.4		0.5
ш	Diborane (B <sub>2</sub> H <sub>6</sub> )						1	1		0.9
INTERFERENC	Dichloro-silane (SiH <sub>2</sub> Cl <sub>2</sub> )	0.2		0					0	
ERF	Disilane (Si <sub>2</sub> H <sub>6</sub> )	0		0.5					0	
	Ethanol (C <sub>2</sub> H <sub>5</sub> OH)	0.2		0					0	
	Ethylene Oxide (EtO) (C <sub>2</sub> H <sub>4</sub> O)	0		0.5					0	
	Fluorine (F <sub>2</sub> )	YES	0.9		0.9		1.6	1.6		1.5
	Germane (GeH₄)									
	Hydrogen (H <sub>2</sub> )	(1) 0.6	0	0.19	0	0	0	0	0	0
	Hydrogen Bromide (HBr)	NEG					0.6	0.6		0.6
	Hydrogen Chloride (HCl)	(-0.2) -0.1	(0.1) 0.01	0	(0.1) 0.01	(0.1) 0.01			0.01	0.8
	Hydrogen Cyanide (HCN)	-0.067		0					0	

#### Meridian sensor interference table

#### SENSORS

	SENSORS									
SENSORS	Meridian Sensor: Part Number: Target Gas:	Ammonia (NH.) 096-3473-03 Ammonia (NH. <sub>3</sub> )	Rock Solid Br. Hi RH (N.H.) 096-3473-24 Bromine (Br. <sub>3</sub> )	Carbon Monoxide (CO) 096-3473-01 Carbon Monoxide (CO)	Rock Solid Cl., Hi RH Rock Solid Cl., Lo RH 096-3473-20 096-3473-21 Chlorine (Cl <sub>3</sub> )	Rock Solid F., HiRH Rock Solid F., Lo RH 096-3473-22 096-3473-23 Fluorine (F <sub>3</sub> )	Rock Solid HCI, Hi RH Rock Solid HCI, Lo RH 096-3473-25 096-3473-26 Hydrogen Chloride (HCI)	Rock Solid HF, Hi RH Rock Solid HF, Lo RH 096-3473-27 096-3473-28 Hydrogen Fluoride (HF)	H <sub>2</sub> S Low Methanol 2096-3473-02 Hydrogen Sulfide (H <sub>2</sub> S)	Rock Solid SO, HIRH Rock Solid SO, Lo RH O96-3473-31 O96-3473-32 Sulfur Dioxide (SO <sub>2</sub> )
	Hydrogen Fluo- ride (HF)	NEG					1			
	Hydrogen Sulfide (H <sub>2</sub> S)	(0.05) 0.01	0	0	0	0	(-0.001) 0.4	(-0.001) 0.4		(-0.002) 0.5
	lodine (I <sub>2</sub> )		0.2		0.2	0.2				
	Isopropanol (CH <sub>3</sub> ) <sub>2</sub> CHOH	0.3		0	,				0	
	Methanol (CH <sub>3</sub> OH)	0.4		0.5					0	
	Methyl lodide (CH <sub>3</sub> I)									
	Methyl Mercap- tan (CH <sub>3</sub> SH)	0		0					0	
ASES	Monomethyl Hydrazine (MMH) CH <sub>3</sub> NHNH <sub>2</sub>	0.5								
G	Nitric Oxide (NO)	(-0.1) -0.09	<0.001	-0.03	<0.001	<0.001	0.002	0.002	-0.005	0.003
N C	Nitrogen Dioxide (NO <sub>2</sub> )	-0.6	0.02	0	0.02	0.02	0.02	0.02	-0.2	0.03
R F	Ozone (O <sub>3</sub> )	0.7	0.07	0.5	0.07	0.08	0.06	0.06	-0.2	0.08
Ш	Phosphine (PH <sub>3</sub> )	(2.8) 1.3		0					0.6	
TER	Silane (SiH₄)	(3.4) 1.3		0.1					0.1	
	Silicon Tetrafluoride (SiF₄)						2.7	2.7		2
	Sulfur Dioxide (SO <sub>2</sub> )	(-0.04) -0.02	(0.01) 0.001	0	(0.01) 0.001	(0.01) 0.001			0.1	
	$\begin{array}{c} {\sf Tetraethyl} \\ {\sf Orthosilicate} \\ ({\sf TEOS}) \\ {\sf Si}({\sf OC}_2{\sf H}_5)_4 \end{array}$									
	Trimethyl Silane (CH <sub>3</sub> ) <sub>3</sub> SiH									
	Tungsten Hexafluoride (WF <sub>6</sub> )						3.4	3.4		2.6
	Vinyl Chloride Monomer (VCM) (C <sub>2</sub> H <sub>3</sub> Cl)									

# NOTES: Meridian

#### 3M<sup>™</sup> Meridian

**Sensor Specifications** 

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