



Indoor Air Quality Instruments and Smart Sensor Specifications



yesAIR

yes
plus LGA

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Indoor Air Quality Instruments

YESAIR 8 Channel Air Quality Monitor



- » 8 sensor capacity
- » > 30 plug & play gas sensor choices
- » PM2.5 or PM10 particulate sensor option
- » Data logging to SD flash card
- » Lightweight, contoured & comfortable handheld device



YES Plus LGA 15 Channel Air Quality Monitor



- » 15 sensor capacity
- » > 30 plug & play sensor choices
- » Data logging to SD flash card
- » Internal sample pump with inline filter



Gas Detection Sensor Technologies

Categories of gas detection systems are defined by the technology they use: electrochemical sensors generally detect toxic gases, catalytic and infrared sensors detect combustible gases and TVOC sensors detect toxic gas, organic compounds and chemicals.



ELECTROCHEMICAL

Toxic gas sensors & oxygen sensors

LIFE SPAN

2 - 5 years (sensor type & manufacturer dependent). Oxygen typically 3 years.

SPECIFICITY

Specific to target gas with known cross sensitivity to a small variety of gases.

RANGE

Typically 0 - 1.0 ppm or 0 - 2,000 ppm, sensor dependent.

POISONING / DAMAGING

- Oxygen deprivation
- Exposure to high concentrations of solvent vapours
- Very high concentrations of target gas
- Reactive gases
- Environments with high temperatures, low temperatures (freezing)
- Very low levels of relative humidity (less than 10 - 15%)

APPLYING SPAN GAS

- Use span gas with air balance or nitrogen balance
- Flow rate should be a minimum of 0.5 LPM (lighter-than air gases) to a maximum of 1.0 LPM (heavier-than-air gases)
- Do NOT humidify span gas when flowing

CATALYTIC

Combustible gas sensors, toxic gas sensors at very high concentrations (% volume)

LIFE SPAN

3 - 8 years (typically if not poisoned)

SPECIFICITY

Specific to combustible gases only in the LEL ranges

RANGE

0 - 100% LEL of target gas

POISONING / DAMAGING

High concentrations of target gas, lead vapours, silicon vapours, alkylated heavy metals.

APPLYING SPAN GAS

- Use span gas with air balance ONLY.
- Flow rate should be a minimum of 0.5 LPM (lighter-than air gases) to a maximum of 1.0 LPM (heavier-than-air gases)
- Do not humidify span gas when flowing

Gas Detection Sensor Technologies

INFRARED

Toxic, combustible & refrigerant gas sensors

LIFE SPAN

10 years +

SPECIFICITY

Specific to target gas.

RANGE

0 - 1,000 ppm or 0 - 100% volume. Target gas, manufacturer dependent.

POISONING / DAMAGING

No known poisoning agents. Condensing humidity will damage sensor and distort readings.

APPLYING SPAN GAS

- Use span gas with air balance or nitrogen balance. Nitrogen balance ONLY for CO₂ sensors.
- Flow rate should be approximately 0.5 LPM. Some sensors are flow sensitive.
- Do NOT humidify span gas when flowing.

PID / TVOCS

Toxic gas sensors, organic compounds & chemicals

LIFE SPAN

3 - 8 years (typically if not contaminated and with regular maintenance)

SPECIFICITY

Non specific. Will respond to any compound that has an ionization potential less than the ionization potential of the lamp.

RANGE

0 - 30 ppm or 0 - 300 ppm, sensor dependent

CONTAMINATION

Many other gases, vapours, chemicals. Condensing humidity can cause false positive readings.

APPLYING SPAN GAS

- Use span gas with air or nitrogen balance.
- Flow rate should be a minimum of 0.5 LPM.
- Do NOT humidify span gas when flowing.

SPECIFICATIONS

Target Gas Sensors

Relative Humidity (RH)

SENSOR

Type	Thin film capacitive
Standard Range	0 - 95% RH (non-condensing)
Resolution*	2% @ 25°C
Accuracy*	No data available
Long Term Drift*	2% (±) / 12 months
Response Time*	< 10 seconds

*specifications at 5 VDC supply and 25°C

INSTRUMENT

Displayed Increments/Decimals	1% RH, no decimals
Warm Up Time @ Switch On	5 minute operational, 20 minute max accuracy
Recommended Calibration Frequency	1 yr for best performance
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	0 - 90% non- condensing
Sensor Lifespan (<i>Estimated</i>)	3 yrs +

Temperature

SENSOR

Type	Negative Coefficient Thermistor
Standard Range	0°C to 50°C (32°F to 122°F)
Resolution	0.1°C @ 25°C
Accuracy	No data available
Long Term Drift	0.5°C (±) / 12 months
Response Time	< 10 seconds

INSTRUMENT

Displayed Increments/Decimals	0.1°C, 1 decimal place
Warm Up Time @ Switch On	5 minute operational, 10 minute max accuracy
Recommended Calibration Frequency	1 yr for best performance
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	0 - 90% non- condensing
Sensor Lifespan (<i>Estimated</i>)	6 yrs +

Ammonia (NH ₃)	50 ppm	PNP-H
SENSOR		
Type	Electrochemical	
Standard Range	0 - 50 ppm	
Resolution	1 ppm	
Accuracy	No data available	
Long Term Drift	< 5% / 6 months	
Response Time	t ₉₀ = < 60 sec calculated fr 5 minute exposure	
Cross Sensitivities	Alcohols @ 1,000 ppm = 0 ppm CO ₂ @ 5,000 ppm = 0 ppm CO @ 100 ppm = 0 ppm Hydrocarbons @ % range = 0 ppm H ₂ @ 10,000 ppm = 0 ppm H ₂ S @ 20 ppm = 2 ppm Cross sensitivity list not fully completed. Sensor maybe sensitive to other gases.	

INSTRUMENT		
Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place	
Warm Up Time @ Switch On	Approx 2 - 2.5 min (warm up delay time)	
Recommended Calibration Frequency	6 months	
Operating Temperature	0°C to 40°C (32°F to 104°F)	
Operating Humidity	15 - 90% non-condensing	
Sensor Lifespan (<i>Estimated</i>)	2 yrs	

Arsine (AsH ₃)	1 ppm	PNP-R
SENSOR		
Type	Electrochemical	
Standard Range	0 - 1 ppm	
Resolution	< 15 ppb @ 20°C (68°F)	
Accuracy	No data available	
Long Term Drift	< 5% / 6 months	
Response Time	t ₉₀ = <30 seconds calc fr 2 minute exposure	
Cross Sensitivities	CO @ 85 ppm = 0 ppm H ₂ @ 3,100 ppm = 0 ppm NO ₂ @ 10 ppm = 2 ppm C ₃ H ₅ OH @ 25,000 ppm = 0 ppm H ₂ S @ 18 ppm = 10.8 ppm SO ₂ @ 18 ppm = 5.4 ppm Cl ₂ @ 0.85 ppm = 0.24 ppm	

Cross Sensitivities <i>continued</i>	HCl @ 7.8 ppm = 1 ppm
	HF @ 7.2 ppm = 0 ppm
	HCN @ 12.6 ppm = 0.7 ppm
	SiH ₄ @ 4.3 ppm = 0.7 ppm
	H ₂ Se @ 0.8 ppm = 0.24 ppm
	B ₂ H ₆ @ 0.2 ppm = 0.28 ppm
PH ₃ @ 0.2 ppm = 0.24 ppm	

INSTRUMENT

Displayed Increments/Decimals	0.001 ppm (1 ppb), 3 decimal places
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	20 - 90% non- condensing
Sensor Lifespan (<i>Estimated</i>)	1.5 yrs

Carbon Dioxide (CO₂)	5,000 ppm	PNP-A+
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SENSOR

Type	Infrared
Standard Range	0 - 5,000 ppm
Resolution	50 ppm fr 0 - 2,500 ppm, then 100 ppm up to FSD
Accuracy	± 2% full scale @ 20°C (68°F), 1 bar pressure, applied gas 2.5% volume CO ₂
Long Term Drift	± 50 ppm / month @ 20°C (68°F) ambient (max ± 150 ppm / yr)
Response Time	t ₉₀ = > 30 seconds @ 20°C (68°F)
Cross Sensitivities	None

INSTRUMENT

Displayed Increments/Decimals	1 ppm, no decimals
Warm Up Time @ Switch On	Approx 2 - 2.5 min (warm up delay time)
Recommended Calibration Frequency	2 yrs, 1 yr for best accuracy
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	5 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	5 - 10 yrs

Carbon Dioxide (CO ₂)	10,000 ppm	PNP-A1
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SENSOR

Type	Infrared
Standard Range	0 - 10,000 ppm
Resolution	50 ppm fr 0 - 2,500 ppm, then 100 ppm up to FSD
Accuracy	± 2% full scale @ 20°C (68°F), 1 bar pressure, applied gas 2.5% volume CO ₂
Long Term Drift	± 500 ppm / month @ 20°C (68°F) ambient
Response Time	t ₉₀ = > 30 seconds @ 20°C (68°F)
Cross Sensitivities	None

INSTRUMENT

Displayed Increments/Decimals	1 ppm, no decimals
Warm Up Time @ Switch On	Approx 2 - 2.5 min (warm up delay time)
Recommended Calibration Frequency	2 yrs, 1 yr for best accuracy
Operating Temperature	5°C to 50°C (32°F to 122°F)
Operating Humidity	0 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	5 - 10 yrs

Carbon Dioxide (CO ₂)	5% volume	PNP-B
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SENSOR

Type	Infrared
Standard Range	0 - 5% volume
Resolution	1% of measuring range for readings above 50% of range, 0.5% of measuring range for readings below 50% of range
Accuracy	± 2% full scale @ 20°C (68°F), 1 bar pressure, applied gas 2.5% volume CO ₂
Long Term Drift	± 500 ppm / month @ 20°C (68°F) ambient
Response Time	t ₉₀ = > 30 seconds @ 20°C (68°F)
Cross Sensitivities	None

INSTRUMENT

Displayed Increments/Decimals	0.1% vol, 1 decimal place
Warm Up Time @ Switch On	Approx 2 - 2.5 min (warm up delay time)
Recommended Calibration Frequency	2 yrs, 1 yr for best accuracy
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	5 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	5 - 10 yrs

Carbon Dioxide (CO ₂)	20% volume	PNP-A2
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SENSOR

Type	Infrared
Standard Range	0 - 20% volume
Resolution	1% of measuring range for readings above 50% of range, 0.5% of measuring range for readings below 50% of range
Accuracy	± 2% of range or ± 10% of the reading up to 80% of the range and then ± 15% of the reading from 80-100% at 20°C (68°F) ambient temperature
Long Term Drift	± 1% volume / month @ 20°C (68°F) ambient
Response Time	t ₉₀ = <30 seconds @ 20°C (68°F)
Cross Sensitivities	None

INSTRUMENT

Displayed Increments/Decimals	0.1% vol, 1 decimal place
Warm Up Time @ Switch On	Approx 2 - 2.5 min (warm up delay time)
Recommended Calibration Frequency	2 yrs, 1 yr for best accuracy
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	5 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	5 - 10 yrs

Carbon Dioxide (CO ₂)	100% volume	PNP-B1
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SENSOR

Type	Infrared
Standard Range	0 - 100% volume
Resolution	1% of measuring range for readings above 50% of range, 0.5% of measuring range for readings below 50% of range
Accuracy	± 1% volume at STP (20°C, 101.325 kPa) & time of calibration ± 10% volume across temperature and pressure when calibrated at altitude
Long Term Zero Drift	± 1% volume / month @ 20°C (68°F) ambient
Response Time	t ₉₀ = < 30 seconds @ 20°C (68°F) ambient
Cross Sensitivities	None

INSTRUMENT

Displayed Increments/Decimals	0.1% vol, 1 decimal place
Warm Up Time @ Switch On	Approx 3 min (warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)

Operating Humidity	0 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	> 5 yrs

Carbon Monoxide (CO)	50 ppm	PNP-C
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SENSOR	
Type	Electrochemical
Standard Range	0 - 50 ppm
Resolution	<0.5 ppm
Accuracy	No data available
Long Term Drift	Zero: < 0.2 ppm equivalent change / yr in lab air Sensitivity: < 3% change / yr in lab air, twice monthly tested
Response Time	$t_{90} = < 25$ seconds from 0 - 400 ppm CO
Cross Sensitivities	SO ₂ sensitivity % measured gas @ 20ppm SO ₂ < 0.1% NO sensitivity % measured gas @ 50ppm NO < 5% NO ₂ sensitivity % measured gas @ 10ppm NO ₂ < 0.1% Cl ₂ sensitivity % measured gas @ 10ppm Cl ₂ < 0.1% H ₂ sensitivity % measured gas @ 400ppm H ₂ at 20oC < 60% C ₂ H ₄ sensitivity % measured gas @ 400ppm C ₂ H ₄ < 25% H ₂ S sensitivity % measured gas @ 20ppm H ₂ S < 0.1% NH ₃ sensitivity % measured gas @ 20ppm NH ₃ < 0.1%

INSTRUMENT	
Displayed Increments/Decimals	0.5 ppm, 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	12 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 yrs

Carbon Monoxide (CO)	50 ppm	PNP-C1
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SENSOR	
Type	Electrochemical (H ₂ compensated for reduced response in H ₂ rich environments with reading possibly showing as high as 60 ppm with 500 ppm H ₂ in monitoring environment)
Standard Range	0 - 50 ppm
Resolution	0.5 ppm
Accuracy	No data available
Long Term Drift	Zero: < 0.2 ppm equivalent change / yr in lab air Sensitivity: 6% change / yr in lab air, monthly test

Response Time	$t_{90} = < 30$ seconds from 0 - 400 ppm CO
Cross Sensitivities	H ₂ sensitivity % measured gas @ 500ppm H ₂ in 900ppm CO @ 10°C = < 2%
	H ₂ sensitivity % measured gas @ 500ppm H ₂ in 900ppm CO @ 20°C = < 4%
	H ₂ sensitivity % measured gas @ 500ppm H ₂ in 900ppm CO @ 30°C = < 6%
	NO ₂ sensitivity % measured gas @ 10ppm NO ₂ = < 0.1%
	Cl ₂ sensitivity % measured gas @ 10ppm Cl ₂ = < 0.1%
	NO sensitivity % measured gas @ 50ppm NO = < 0.1%
	SO ₂ sensitivity % measured gas @ 20ppm SO ₂ = < 0.1%
C ₂ H ₄ sensitivity % measured gas @ 400ppm C ₂ H ₄ = < 30%	
NH ₃ sensitivity % measured gas @ 20ppm NH ₃ = < 0.1%	

INSTRUMENT

Displayed Increments/Decimals	0.5 ppm, 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	12 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 yrs

Chlorine (Cl ₂)	5 ppm	PNP-I
SENSOR		
Type	Electrochemical	
Standard Range	0 - 5 ppm	
Resolution	0.02 ppm	
Accuracy	No data available	
Long Term Drift	Zero: < 0.2 ppm equivalent change / yr in clean air with monthly test.	
	Sensitivity: < 0.4 ppm change / month in clean air with twice monthly test	
Response Time	$t_{90} = < 40$ seconds from 0 - 5ppm (diffusion)	
Cross Sensitivities	H ₂ S @ 20 ppm = < -40 ppm	
	NO ₂ @ 10ppm = 100 ppm	
	NO @ 50 ppm = < 0.5 ppm	
	SO ₂ @ 20 ppm = < -2.5 ppm	
	CO @ 400 ppm = < 0.1 ppm	
	H ₂ @ 400 ppm = < 0.1 ppm	
	C ₂ H ₄ @ 400 ppm = < 0.1 ppm	

INSTRUMENT

Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 - 2.5 yrs

Chlorine Dioxide (Cl₂)	1 ppm	PNP-J
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SENSOR

Type	Electrochemical
Standard Range	0 - 1 ppm
Resolution	0.03 ppm
Accuracy	No data available
Long Term Drift	< 5% / 6 months
Response Time	t ₅₀ = < 20 seconds calc fr 4 minute exposure time t ₉₀ = < 120 seconds calc fr 4 minute exposure
Cross Sensitivities	Alcohols @ 1,000 ppm = 0 ppm CO @ 100 ppm = 0 ppm Cl ₂ @ 1 ppm = 0.6 ppm O ₃ @ 0.25 ppm = 0.7 ppm H ₂ @ 3,000 ppm = 0 ppm H ₂ S @ 20 ppm = -5 ppm

INSTRUMENT

Displayed Increments/Decimals	0.01 ppm (10 ppb), 2 decimal places
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	0 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 yrs

Combustibles	100% LEL	PNP-X
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SENSOR

Type	Catalytic Pellistor
Standard Range	0 - 100% LEL
Resolution	1% LEL
Accuracy	No data available
Linear to	3% methane

Long Term Drift	Sensitivity = < 5% signal / month Zero = < 5% LEL (methane)/ month	
Response Time	t_{90} = < 10 seconds (methane)	
Relative Sensitivity Responds to most flammable gases and vapours. (the results are intended for guidance only at the same %LEL concentration)	Methane	100%
	Hydrogen	106%
	Ethylene	96%
	Propane	82%
	Isobutane	74%
	n-Pentane	67%
	Hexanes	50%
	Alcohols	no data included
	Acetylene	no data included
	all combustibles	no data included

INSTRUMENT

Displayed Increments/Decimals	1% LEL, no decimals
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	1 yr for best performance
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	10 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	5 yrs

Ethylene (C ₂ H ₄)	200 ppm	PNP-E1
SENSOR		
Type	Electrochemical	
Standard Range	0 - 200 ppm	
Resolution	1 ppm	
Accuracy	No data available	
Long Term Drift	< 5% / month	
Response Time	t_{90} = < 100 seconds	
Cross Sensitivities	CO = < 60%	

INSTRUMENT

Displayed Increments/Decimals	1 ppm, no decimals
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 - 3 yrs

Ethylene Oxide (C ₂ H ₄ O)	20 ppm	PNP-E2
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SENSOR

Type	Electrochemical
Standard Range	0 - 20 ppm
Resolution	0.1 ppm
Accuracy	No data available
Long Term Drift	< 5% signal loss / yr
Response Time	t ₉₀ = < 120 seconds
Cross Sensitivities	Ethanol ≈ 55% Toluene ≈ 20% Methyl-ethyl-ketone ≈ 10% CO ≈ 40%

INSTRUMENT

Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (Estimated)	2 - 3 yrs

Fluorine (F ₂)	2 ppm	PNP-S
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SENSOR

Type	Electrochemical
Standard Range	0 - 2 ppm
Resolution	< 0.02 ppm @ 20°C (68°F)
Accuracy	No data available
Long Term Drift	< 5% / month
Response Time	t ₉₀ = < 80 sec calc fr 4 minute exposure with 1 ppm Cl ₂
Cross Sensitivities	Alcohols @ 1,000 ppm = 0 ppm AsH ₃ @ 0.2 ppm = -0.03 ppm Br = yes; n/d CO ₂ @ 5,000 ppm = 0 ppm CO @ 100 ppm = 0 ppm Cl ₂ @ 1 ppm = 1.4 ppm B ₂ H ₆ @ 0.25 ppm = -0.01 ppm Hydrocarbons @ % range = 0 ppm HCl @ 5 ppm = -7 ppm H ₂ @ 10,000 ppm = 0 ppm HCN @ 1 ppm = -0.05 ppm

Cross Sensitivities <i>continued</i>	H ₂ S @ 1 ppm = -2 ppm
	N ₂ @ 100% = 0 ppm
	NO ₂ @ 10 ppm = 8 ppm
	O ₃ @ 0.25 ppm = 0.3 ppm
	PH ₃ @ 0.3 ppm = approximately -0.1 ppm; n/d
	SO ₂ @ 20 ppm = -0.2 ppm

INSTRUMENT

Displayed Increments/Decimals	0.01 ppm (10 ppb), 2 decimal places
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	1.5 - 2 yrs

Formaldehyde (CH ₂ O)	5 ppm	PNP-Q
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SENSOR

Type	Electrochemical
Standard Range	0 - 5 ppm
Resolution	0.01 ppm
Accuracy	No data available
Long Term Drift	< 2% signal loss / month
Response Time	t ₅₀ = < 80 sec
Cross Sensitivities	H ₂ = 1 - 3%
	CO = 10 - 18%
	Interference from other reducing gases such as alcohol. <i>See Important Notes #4</i>

INSTRUMENT

Displayed Increments/Decimals	0.01 ppm (10 ppb), 2 decimal places
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 - 3 yrs in air

Hydrogen (H ₂)	1,000 ppm	PNP-K
SENSOR		
Type	Electrochemical	
Standard Range	0 - 1,000 ppm	
Resolution	2 ppm	
Accuracy	No data available	
Long Term Drift	< 2% / months	
Response Time	t ₉₀ = < 90 seconds	
Cross Sensitivities	CO @ 300 ppm = ≤ 60 ppm H ₂ S @ 15 ppm = < 3 ppm SO ₂ @ 5 ppm = 0 ppm NO @ 35 ppm ≈ 10 ppm NO ₂ @ 5 ppm = 0 ppm Cl ₂ @ 1 ppm = 0 ppm HCN @ 10 ppm ≈ 3 ppm HCl @ 5 ppm = 0 ppm C ₂ H ₄ @ 100 ppm ≈ 80 ppm	

INSTRUMENT		
Displayed Increments/Decimals	1 ppm, no decimals	
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)	
Recommended Calibration Frequency	6 months	
Operating Temperature	0°C to 50°C (32°F to 122°F)	
Operating Humidity	15 - 90% non-condensing	
Sensor Lifespan (<i>Estimated</i>)	2 yrs +	

Hydrogen Chloride (HCl)	30 ppm	PNP-M
SENSOR		
Type	Electrochemical	
Standard Range	0 - 30 ppm	
Resolution	< 0.7 ppm @ 20°C (68°F)	
Accuracy	No data available	
Long Term Drift	< 3% / month	
Response Time	t ₉₀ = < 70 seconds calc fr 4 minute exposure	
Cross Sensitivities	Alcohols @ 1,000 ppm = 0 ppm NH ₃ @ 100 ppm = 0 ppm AsH ₃ @ 0.2 ppm = 0.7 ppm CO ₂ @ 5,000 ppm = 0 ppm CO @ 100 ppm = 0 ppm Cl ₂ @ 5 ppm = < ±0.1 ppm	

Cross Sensitivities <i>continued</i>	Hydrocarbons @ % range = 0 ppm
	H ₂ @ 10,000 ppm = 0 ppm
	H ₂ CO @ 20 ppm = 7 ppm
	H ₂ S @ 20 ppm = 60 ppm
	NO @ 100 ppm = 45 ppm
	N ₂ @ 100% = 0 ppm
	NO ₂ @ 10 ppm = < ±0.5 ppm
PH ₃ @ 0.1 = 0.3 ppm	
SO ₂ @ 20 ppm = 8 ppm	

INSTRUMENT

Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 yrs

Hydrogen Cyanide (HCN)	30 ppm	PNP-N
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SENSOR

Type	Electrochemical
Standard Range	0 - 30 ppm
Resolution	0.2 ppm
Accuracy	No data available
Long Term Drift	< 5% / month
Response Time	t ₉₀ = < 50 seconds calc fr 2 minute exposure
Cross Sensitivities	Alcohols @ 1,000 ppm = 0 ppm
	CO ₂ @ 5,000 ppm = 0 ppm
	CO @ 100 ppm = 0 ppm
	Hydrocarbons @ % range = 0 ppm
	H ₂ @ 10,000 ppm = 0 ppm
	NO @ 100 ppm = -5 ppm
	NO ₂ @ 10 ppm = -7 ppm
	H ₂ S @ 20 ppm = 0 ppm
	(short gas exposure in minute range; after filter saturation: ca. 40 ppm reading)

INSTRUMENT

Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months

Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	1.5 - 2 yrs

Hydrogen Fluoride (HF)	10 ppm	PNP-0
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SENSOR	
Type	Electrochemical
Standard Range	0 - 10 ppm
Resolution	0.2 ppm @ 20°C (68°F)
Accuracy	No data available
Long Term Drift	< 10% in 6 months
Response Time	$t_{90} = < 90$ seconds calc fr 4 minute exposure
Cross Sensitivities	$C_2H_4O_2$ @ 100 ppm = 100 ppm Alcohols @ 1,000 ppm = 0 ppm CO_2 @ 5,000 ppm = 0 ppm CO @ 100 ppm = 0 ppm Cl_2 @ 1 ppm = 0.7 ppm Hydrocarbons @ % range = 0 ppm H_2 @ 3,000 ppm = < 1 ppm HCl @ 10 ppm = 6 ppm SO_2 @ 20 ppm = 16 ppm

INSTRUMENT	
Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	1.5 yrs +

Hydrogen Sulphide (H ₂ S)	50 ppm	PNP-L
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SENSOR	
Type	Electrochemical
Standard Range	0 - 50 ppm
Resolution	< 0.05 ppm
Accuracy	No data available
Long Term Drift	Zero: < 0.1 ppm equivalent change / yr in clean air Sensitivity: < 4% change / yr in clean air with monthly test
Response Time	$t_{90} = < 25$ seconds fr 0 - 20 ppm

Cross Sensitivities	NO ₂ @ 10 ppm = < -20 ppm
	Cl ₂ @ 10 ppm = -25 ppm
	NO @ 50 ppm = < 4 ppm
	SO ₂ @ 20 ppm = < 10 ppm
	CO @ 400 ppm = < 1.5 ppm
	H ₂ @ 400 ppm = < 0.2 ppm
	C ₂ H ₄ @ 400 ppm = < 0.5 ppm
NH ₃ @ 20 ppm = < 0.1 ppm	

INSTRUMENT

Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 - 3 yrs

Methane (CH₄)	5% volume	PNP-B+
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SENSOR

Type	Non Dispersive Infrared (NIDR)
Standard Range	0 - 5% volume
Resolution	0.01%
Accuracy	± 2% full scale @ 20°C (68°F), 1 bar pressure, at calibration point
Long Term Drift	± 0.05% volume per month
Response Time	t ₉₀ = < 30 seconds

INSTRUMENT

Displayed Increments/Decimals	0.01% vol, 2 decimal places
Warm Up Time @ Switch On	Approx 2 - 2.5 min (warm up delay time)
Recommended Calibration Frequency	12 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	5- 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	5 yrs

Nitrogen Dioxide (NO ₂)	5 ppm	PNP-D
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SENSOR

Type	Electrochemical
Standard Range	0 - 5 ppm
Resolution	0.1 ppm
Accuracy	No data available
Long Term Drift	< 2% signal loss / month
Response Time	t ₉₀ = < 25 seconds
Cross Sensitivities	H ₂ S @ 20 ppm = < -40 ppm Cl ₂ @ 10 ppm = 100 ppm NO @ 50 ppm = < 0.5 ppm SO ₂ @ 20 ppm = < -2.5 ppm CO @ 400 ppm = < 0.1 ppm H ₂ @ 400 ppm = < 0.1 ppm C ₂ H ₄ @ 50 ppm = < 0.1 ppm NH ₃ @ 20 ppm = < 0.1 ppm CO ₂ @ 5% volume = < 0.1 ppm

INSTRUMENT

Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 - 3 yrs

Nitric Oxide (NO)	100 ppm	PNP-E
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SENSOR

Type	Electrochemical
Standard Range	0 - 100 ppm
Resolution	< 0.2 ppm
Accuracy	No data available
Long Term Drift	Zero: 0.5 ppm equivalent change fr -20°C to 20°C (-4°F to 68°F), 1 - 3 ppm equivalent change 20°C to 50°C (68°F to 122°F) Sensitivity: 101 - 105% output change @ 50 ppm btw 20°C (68°F) & 50°C (122°F)
Response Time	t ₉₀ = < 20 seconds fr 0 - 50 ppm

Cross Sensitivities	H ₂ S @ 20 ppm = < 30 ppm NO ₂ @ 50 ppm = < 5 ppm Cl ₂ @ 10 ppm = < 15 ppm SO ₂ @ 20 ppm = < 3 ppm H ₂ @ 400 ppm = < 0.1 ppm CO @ 400 ppm = < 0.1 ppm NH ₃ @ 20 ppm = < 0.1 ppm CO ₂ @ 5% volume = < 0.1 ppm
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INSTRUMENT

Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 - 3 yrs

Oxygen (O ₂)	25% volume	PNP-P
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SENSOR

Type	Electrochemical
Standard Range	0 - 25% volume
Resolution	0.1% volume
Accuracy	No data available
Long Term Drift	< 2% change in output over 3 months
Response Time	t ₉₀ = < 15 seconds from 20.9% to 0%
Cross Sensitivities	CO ₂ sensitivity: +0.1% % change in output / % CO ₂ @ 5% CO ₂

INSTRUMENT

Displayed Increments/Decimals	0.1% vol, 1 decimal place
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	< 0.7% fr 0 - 95% RH @ 40°C (104°F)
Sensor Lifespan (<i>Estimated</i>)	3 yrs

Ozone (O ₃)	1 ppm	PNP-G
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SENSOR

Type	Electrochemical
Standard Range	0 - 1 ppm
Resolution	< 0.02 ppm @ 20°C (68°F)
Accuracy	No data available
Long Term Drift	< 10% / 6 months @ 20°C (68°F) and 30 - 50% RH
Response Time	t ₉₀ = < 60 seconds calc from 3 minute exposure @ 30 cc / min flow
Cross Sensitivities	Br, I ₂ = yes; n/d CO ₂ @ 5,000 ppm = 0 ppm CO @ 100 ppm = 0 ppm Cl ₂ @ 1 ppm = 1.2 ppm N ₂ H ₄ @ 3 ppm = -3 ppm H ₂ @ 3,000 ppm = 0 ppm H ₂ S @ 20 ppm = -1.6 ppm N ₂ @ 100% = 0 ppm NO ₂ @ 10ppm = 6 ppm

INSTRUMENT

Displayed Increments/Decimals	0.01 ppm (10 ppb), 2 decimal places
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	1.5 - 2 yrs

Ozone (O ₃)	5 ppm	PNP-G1
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SENSOR

Type	Electrochemical
Standard Range	0 - 5 ppm
Resolution	0.02 ppm
Accuracy	No data available
Zero Offset Drift	< 0.1 ppm (-20°C to 50°C / -4°F to 122°F)
Response Time	t ₉₀ = < 60 seconds
Cross Sensitivities	Br, I ₂ = yes; n/d CO ₂ @ 5,000 ppm = 0 ppm CO @ 100 ppm = 0 ppm Cl ₂ @ 1 ppm = 1.2 ppm

Cross Sensitivities <i>continued</i>	N ₂ H ₄ @ 3 ppm = -3 ppm
	H ₂ @ 3,000 ppm = 0 ppm
	H ₂ S @ 20 ppm = -1.6 ppm
	N ₂ @ 100% = 0 ppm
	NO ₂ @ 10ppm = 6 ppm

INSTRUMENT

Displayed Increments/Decimals	0.01 ppm (10 ppb), 2 decimal places
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	1.5 - 2 yrs
Lowest Alarm Setpoint	1 ppm

Phosphine (PH ₃)	5 ppm	PNP-V
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SENSOR

Type	Electrochemical
Standard Range	0 - 5 ppm
Resolution	Lower detection limit < 30 ppb
Accuracy	No data available
Long Term Drift	< 5% / 6 months
Response Time	t ₉₀ = < 30 seconds

Cross Sensitivities	CO @ 85 ppm = 0 ppm
	H ₂ @ 3,100 ppm = 0 ppm
	NO ₂ @ 10 ppm = 2 ppm
	C ₃ H ₅ OH @ 25,000 ppm = 0 ppm
	H ₂ S @ 18 ppm = 13 ppm
	SO ₂ @ 18 ppm = 6.5 ppm
	Cl ₂ @ 0.85 ppm = 0.29 ppm
	HCl @ 7.8 ppm = 1.2 ppm
	HF @ 7.2 ppm = 0 ppm
	HCN @ 12.6 ppm = 0.84 ppm
	SiH ₄ @ 4.3 ppm = 0.84 ppm
	H ₂ Se @ 0.8 ppm = 0.29 ppm
	B ₂ H ₆ @ 0.2 ppm = 0.34 ppm
AsH ₃ @ 0.2 ppm = 0.16 ppm	

INSTRUMENT

Displayed Increments/Decimals	0.01 ppm (10 ppb), 2 decimal places
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)

Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	10 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	2 yrs

Silane (SiH ₄)	20 ppm	PNP-W
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SENSOR	
Type	Electrochemical
Standard Range	0 - 20 ppm
Resolution	0.05 ppm
Accuracy	No data available
Long Term Drift	< 5% / 6 months
Response Time	t ₉₀ = < 60 seconds calc fr 2 min exposure
Cross Sensitivities	CO @ 85 ppm = 0 ppm H ₂ @ 3,100 ppm = 0 ppm NO ₂ @ 10 ppm = 2.3 ppm C ₃ H ₅ OH @ 25,000 ppm = 0 ppm H ₂ S @ 18 ppm = 8 ppm SO ₂ @ 18 ppm = 7.4 ppm Cl ₂ @ 0.85 ppm = 0.1 ppm HCl @ 8 ppm = 0.45 ppm HF @ 7.2 ppm = 0 ppm HCN @ 12 ppm = 0.77 ppm AsH ₃ @ 0.16 ppm = 0.2 ppm H ₂ Se @ 0.8 ppm = 0.2 ppm B ₂ H ₆ @ 0.2 ppm = 0.27 ppm PH ₃ @ 0.2 ppm = 0.35 ppm

INSTRUMENT	
Displayed Increments/Decimals	0.01 ppm (10 ppb), 2 decimal places
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	6 months
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	20 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	1.5 yrs

Sulphur Dioxide (SO ₂)	20 ppm	PNP-P
SENSOR		
Type	Electrochemical	
Standard Range	0 - 20 ppm	
Sensor Resolution	< 0.1 ppm	
Accuracy	No data available	
Long Term Drift	< 4% change / month in clean air, monthly test	
Response Time	t ₉₀ = < 25 seconds fr 0 - 10 ppm	
Cross Sensitivities	H ₂ @ 20 ppm = < 0.1 NO ₂ @ 10 ppm = < -130 ppm Cl ₂ @ 10 ppm = < -40 ppm NO @ 50 ppm = < ±2 ppm CO @ 400 ppm = < 1.6 ppm H ₂ @ 400 ppm = < 0.3 ppm C ₂ H ₄ @ 400 ppm = < 40 ppm NH ₃ @ 20 ppm = < 0.1 ppm	

INSTRUMENT		
Displayed Increments/Decimals	0.1 ppm (100 ppb), 1 decimal place	
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)	
Recommended Calibration Frequency	6 months	
Operating Temperature	0°C to 40°C (32°F to 104°F)	
Operating Humidity	15 - 90% non-condensing	
Sensor Lifespan (<i>Estimated</i>)	2 yrs	

TVOC	30 ppm	PNP-Z+
SENSOR		
Type	Photolonization Detector	
Standard Range	0 - 30 ppm	
Resolution	1 ppb (0.001 ppm) isobutylene	
Accuracy	No data available	
Long Term Drift	< 2% change / month in clean air	
Response Time	t ₉₀ = < 3 seconds	
Cross Sensitivities	Many chemicals & gases. Refer to manual.	

INSTRUMENT		
Displayed Increments/Decimals	0.01 ppm (10 ppb), 2 decimal places	
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)	
Recommended Calibration Frequency	monthly to 4 months (usage dependent)	
Operating Temperature	0°C to 50°C (32°F to 122°F)	

Operating Humidity	0 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	5 yrs (excluding replacable lamp & electrode stack)

TVOC	30 ppm	PNP-Y+
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SENSOR	
Type	Photolization Detector
Standard Range	0 - 300 ppm
Resolution	100 ppb (0.1 ppm) isobutylene
Accuracy	No data available
Long Term Drift	< 2% change / month in clean air
Response Time	$t_{90} = <3$ seconds
Cross Sensitivities	Many chemicals & gases. Refer to manual.

INSTRUMENT	
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Displayed Increments/Decimals	1 ppm, no decimals
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	monthly to 4 months (usage dependent)
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	0 - 90% non-condensing
Sensor Lifespan (<i>Estimated</i>)	5 yrs (excluding replacable lamp & electrode stack)

Particulate Sensor	CET-PM2.5 or CET-PM10
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SENSOR	
Type	Optical - laser LED and photosensor
Particle Size Range	0.3 - 10 μm
Resolution	1 $\mu\text{g}/\text{m}^3$
Detection Range	1 - 999 $\mu\text{g}/\text{m}^3$
Detection Error	< 100 $\mu\text{g}/\text{m}^3 = \pm 15 \mu\text{g}/\text{m}^3$ > 100 $\mu\text{g}/\text{m}^3 = \pm 15 \%$
Response Time	10 sec

Sensitivities	<p>Build up of dust adhered to the vents or the inside of the sensor should be cleaned with a vacuum or compressed air duster.</p> <p>The density of the particles being monitored is relevant to the accuracy of the sensor.</p> <p>Sensor may be affected by noise generating equipment such as an electric dust collector or power supply line.</p> <p>The sensor may be affected by vibration or mechanical oscillation.</p> <p>Avoid adhesive particles such as oil.</p>
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INSTRUMENT

Displayed Increments/Decimals	PM2.5 or PM10 - 1 µg/m ³ , no decimals
Warm Up Time @ Switch On	Approximately 2 - 2.5 min (instrument warm up delay time)
Recommended Calibration Frequency	n/a
Operating Temperature	0°C to 50°C (14°F to 122°F)
Operating Humidity	35 - 85% non- condensing (sensor limitation)
Sensor Lifespan (<i>Estimated</i>)	5+ years (depends on application and atmosphere, continuous mode or intermittent use)

Important Notes

Additional chemical symbols not defined previously:

Br	Bromine	C_2H_2	Acetylene	B_2H_6	Diborane
ClF_3	Chlorine Trifluoride	C_3H_8O	Isopropyl Alcohol		

Notes:

1. Some sensors may be calibrated with correlation gases. If you prefer to have specific sensors calibrated with the target gas, contact our factory for availability and extra costs. Customer will have to bear the cost of the full cylinder of specialty gas plus incoming dangerous goods freight and take ownership of the cylinder of gas remaining.
2. These specifications have been developed from data considered accurate at the time. No warranty is implied or suggested based on this data. We accept no responsibility for errors or omissions.
3. Critical Environment Technologies Canada Inc. reserves the right to make design and specification changes without prior notice.
4. Formaldehyde sensor has high cross sensitivity to Carbon Monoxide, Alcohol & Hydrogen.
5. Combustible (flammable) gas sensors (catalytic) can be calibrated for a number of target gases. Please specify the target gas desired & we will evaluate your request.