



Midas® Sensor Cartridge Specifications

Mineral Acids (HF Group)

MIDAS-E-HFX, MIDAS-S-HFX

Gas Measured	Hydrogen Fluoride (HF)
Cartridge Part Number	MIDAS-S-HFX MIDAS-E-HFX
Sensor Technology	3 electrode electrochemical cell
Measuring Range	HF 0 - 12ppm
Minimum Alarm 1 Set Point	1.45ppm
Lower Detection Limit	1.05ppm
Linearity	< ± 10% of measured value
Repeatability	< ± 10% of measured value
Resolution	0.05ppm
Response Time $t_{62.5}$	≤ 30 seconds
Sensor Cartridge Life Expectancy	≥ 24 months under typical application conditions
Operating Temperature	0°C to +40°C (32°F to 104°F)
Effect of Temperature	
Zero	< ± 0.008ppm / °C
Sensitivity	< ± 0.4% of measured value / °C
Operating Humidity	10 to 90% RH
Effect of Humidity	
Zero	< ± 0.003ppm / % RH
Sensitivity	< ± 1% of measured value / % RH
Operating Pressure	90 – 110kPa
Effect of Position	No effect in typical application
Long Term Drift	
Zero	No drift
Sensitivity	< 15% of measured value / year
Calibration Gas	Hydrogen Fluoride (HF)
Bump Test Gas	Chlorine (Cl ₂)
Warm Up Time	< 20 minutes
Storage Temperature	+5°C to +25°C (+41°F to +77°F)

The sensor data listed is based on ideal test environment; observed performance may vary based on the actual monitoring system and the sampling conditions employed.

Other Detectable Gases

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

Detectable Gas	Chemical Formula	Measuring Range
Tungsten Hexafluoride	WF ₆	0-12ppm
Boron Trifluoride	BF ₃	0-8ppm
Nitrogen Trifluoride	NF ₃	0-40ppm

Cross Sensitivities

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

Gas Measured	Chemical Formula	Concentration Applied(ppm)	Reading (ppm HF)
Chlorine	Cl ₂	1	1.5
Diborane	B ₂ H ₆	1	0 (Negative drift)
Hydrogen Chloride	HCl	4	3.2
Hydrogen Sulfide	H ₂ S	25	0 (Negative drift)
Nitrogen Dioxide	NO ₂	5	0.65
Phosphine	PH ₃	1	0 (Negative drift)
Sulfur Dioxide	SO ₂	50	0 (Negative drift)
Arsine	AsH ₃	1	0
Carbon Monoxide	CO	2000	0
Hydrogen	H ₂	20000	0
Iso Propanol	C ₃ H ₇ OH	500	0
Methanol	CH ₃ OH	500	0
Silane	SiH ₄	10	0
Ammonia	NH ₃	50	0
Ozone	O ₃	0.2	0
Ethylene Oxide	C ₂ H ₄ O	20	0
Nitric Oxide	NO	50	0
Carbon Dioxide	CO ₂	10000	0

Interference differs from cartridge to cartridge and over cell life. It is not recommended to calibrate with cross sensitivity factors. The target gas should be used for calibration.