

Midas[®] SENSOR CARTRIDGE SPECIFICATIONS

Nitrogen Trifluoride NF₃ and Methyl Fluoride CH₃F Midas-S-XHF, Midas-E-XHF



Gas Measured	Nitrogen Trifluoride (NF ₃)
Cartridge Part Number	MIDAS-S-XHF 1 year standard warranty MIDAS-E-XHF 2 year extended warranty
Sensor Technology	3 electrode electrochemical cell
Measuring Range (ppm)	NF ₃ 0 - 40 ppm
Minimum Alarm 1 Set Point	4.0ppm
Repeatability	< ± 10% of measured value
Linearity	< ± 20% of measured value
Response Time t _{62.5}	< 110 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	< ± 0.002ppm / °C (at 0°C to 20°C) < ± 0.008ppm / °C (at 20°C to 40°C)
Zero Sensitivity	< ± 0.4% of measured value / °C
Operating Humidity (continuous)	20 – 75% rH ¹
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)
Challenge Gas (Bump Test)	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.

Separate Pyrolyzer module (MIDAS-T-NP1) required with the Nitrogen Trifluoride sensor cartridge to detect NF₃ by thermal breakdown. To maintain stated performance, it is recommended to perform gas calibration every 6 months, and ensure the constant temperature of the installation point is in 50 – 104°F (10 – 40°C) and the humidity is in 30 – 70 %RH. Otherwise, more frequent bump testing or calibration will be required to confirm working specifications.

Other Detectable Gases

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

Detectable Gas	Chemical Formula	Measuring Range
Methyl Fluoride	CH ₃ F	0 – 120ppm

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 / Vapor	Chemical Formula	Concentration applied (ppm)	Reading (ppm NF ₃)
Arsine	AsH ₃	1	0
Carbon Monoxide	CO	2000	0
Chlorine	Cl ₂	5	34.5
Diborane	B ₂ H ₆	1	-1.3
Hydrogen	H ₂	20000	0
Hydrogen Chloride	HCl	8	14
Hydrogen Fluoride	HF	2	9.2
Hydrogen Sulphide	H ₂ S	25	-3.6
Iso Propanol	C ₃ H ₇ OH	500	0
Methanol	CH ₃ OH	500	0
Nitrogen Dioxide	NO ₂	5	2.6
Phosphine	PH ₃	1	-0.14
Sulphur Dioxide	SO ₂	10	22.8

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.

Find out more

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