# HF GROUP)

**Smart Sensor Specifications** 

Bringing new visibility, reliability, and ease-of-use to gas detection in semiconductor processing and industrial manufacturing.

GAS MEASURED	HYDROGEN FLUORIDE (HF)	
Cartridge Part Number	MMS-Z2	
Sensor Technology	3 electrode electrochemical cell	
Measuring Range	HFO ppm to 12 ppm	
Default Alarm 1	1.5 ppm (rising)	
Default Alarm 2	3 ppm (rising)	
Accuracy	<±5% of measured value Exposure to HF 6 ppm for 5 minutes	
Response Time (t <sub>62.5</sub> )	Typical 29 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 Sensitivity	<±0.015 ppm/°C <±0.4% of measured value/°C	
Operating Humidity (continuous)	20% RH to 75% RH	
Effect of Humidity Zero Sensitivity	<±0.003 ppm/%RH <±1% of measured value/%RH	
Operating Pressure	90 kPa to 110 kPa	
Effect of Position	No effect in typical application	
Long Term Drift Zero Sensitivity	No drift <15% of measured value/year	
Calibration Gas	Hydrogen Fluoride (3 ppm to 9 ppm, 6 ppm)	
Challenge Gas (Bump Test)	Chlorine (10 ppm)	
Warm Up Time	<20 minutes	
Storage Temperature	5°C to 25°C (41°F to 77°F)	

The sensor data listed is based on the test data under normal lab test conditions (20°C to 25°C, 0% RH to 60% RH, normal atmosphere pressure); observed performance may vary based on the actual monitoring system and the sampling conditions employed.

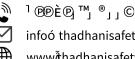
NOTE: The HF sensor should not be used with  $NH_3$  or  $SO_2$  sensor in same Midas®-M unit.



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# Midas®-M Mineral Acids (HF Group) 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®-M transmitter with the designated identification code for each of the following gas types:

<b>DETECTABLE GAS</b>	CHEMICAL FORMULA	MEASURING RANGE
Boron Trifluoride	BF <sub>3</sub>	0 ppm to 8 ppm
Tungsten Hexafluoride	WF <sub>6</sub>	0 ppm to 12 ppm

### **CROSS SENSITIVITIES**

Each Midas-M 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).

NOTE: The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation.

GAS/VAPOR	CHEMICAL FORMULA	CONCENTRATION APPLIED (ppm)	READING (ppm HF)
Arsine	AsH <sub>3</sub>	1	0
Carbon Monoxide	CO	2000	0
Chlorine	Cl2	1	1.5
Diborane	$B_2H_6$	1	-1.3
Hydrogen	H <sub>2</sub>	20000	0
Hydrogen Chlorine	HCl	8	14
Hydrogen Sulphide	H <sub>2</sub> S	25	-3.6
Iso Propanol	C <sub>3</sub> H <sub>7</sub> OH	500	0
Methanol	CH₃OH	500	0
Nitrogen Dioxide	NO <sub>2</sub>	5	0.65
Phosphine	PH <sub>3</sub>	1	-0.14
Sulphur Dioxide	SO <sub>2</sub>	50	28.3