



ALTAIR® 2X, 4XR & 5X Gas Detectors & ALTAIR io™ 4 Gas Detection Wearable

Electrochemical Sensor Cross-Sensitivity Data*

It is quite common for electrochemical sensors to be cross-sensitive to specific gases other than the target gas of interest. Cross-sensitivities are limited as much as possible by sensor design, but some interactions still exist. The tables below are a general guide to these common cross-sensitivities which can be used to understand gas detector readings in environments where multiple gases may be present.



Using Cross-Sensitivity Data

Below you will find multiple scenarios to aid in the use of the provided cross-sensitivity data. It is important to note that cross-sensitivities are additive. Thus when the target gas and cross-sensitive gas are present, the sensor reading will combine both concentrations to provide a summed reading on the detector

XCell CO Sensors						
Scenario	Gas in Environment	Environmental Gas Concentration (ppm)	CO Cross-Sensitivity	Gas Detector CO Reading (ppm)	Actual CO in Environment (ppm)	
Target Gas Concentration	CO	50	100%	50	50	
Cross-Sensitive Gas in Environment	NO	50	84%	42	0	
Target Gas & Cross-Sensitive Gas in Environment	CO/NO	50 CO/50 NO	100% CO/ 84% NO	50 + 42 = 92	50	
Negative Cross-Sensitive Gas in Environment	HCN	20	-5%	-1	0	
Target Gas & Cross-Sensitive Gas in Environment	CO/HCN	50 CO/20 HCN	100% CO/-5% HCN	50 + (-1) = 49	50	

MSA XCell® Sensor Cross-Sensitivity Data*

XCell CO & CO-HC Sensors			
Gas Applied	Concentration Applied (ppm)	CO Cross-Sensitivity	CO Reading**
CO	100	100%	100
H ₂ S	40	0%	0
SO ₂	9	-4%	-1
NO ₂	11	0%	0
NH ₃	25	0%	0
Cl ₂	10	0%	0
NO	50	84%	42
HCN	30	-5%	-2
Toluene	53	0%	0
Isopropanol	100	-8%	-8
H ₂	100	48%	48

XCell H ₂ S & H ₂ S-LC Sensors			
Gas Applied	Concentration Applied (ppm)	H ₂ S Cross-Sensitivity	H ₂ S Reading**
H ₂ S	40	100%	40
CO	100	1%	1
SO ₂	9	14%	2
NO ₂	11	-1%	-1
NH ₃	25	-1%	-1
Cl ₂	10	-14%	-2
NO	50	25%	13
HCN	30	-3%	-1
Toluene	53	0%	0
Isopropanol	100	-3%	-3
H ₂	100	0%	0

WE KNOW WHAT'S AT STAKE.

MSA XCell® Sensor Cross-Sensitivity Data* (cont.)

XCell SO ₂ (Single) Sensors			
Gas Applied	Concentration Applied (ppm)	SO ₂ (Single) Cross-Sensitivity	SO ₂ Reading**
SO ₂	24.5	100%	25
CO	1000	0.0%	0
H ₂ S	199	0.1%	1
NO ₂	10	-80%	-8
NH ₃	121	-0.1%	-1
Cl ₂	15.3	0.7%	1
PH ₃	5	18%	1
HCN	50.4	5%	3
Isopropanol	500	0%	0
H ₂	2000	1%	20
Acetylene	100	4%	4

XCell SO ₂ (Two-Tox) Sensors			
Gas Applied	Concentration Applied (ppm)	SO ₂ Cross-Sensitivity	SO ₂ Reading**
H ₂ S	40	100%	40
CO	100	1%	1
SO ₂	9	14%	2
NO ₂	11	-1%	-1
NH ₃	25	-1%	-1
Cl ₂	10	-14%	-2
NO	50	25%	13
HCN	30	-3%	-1
Toluene	53	0%	0
Isopropanol	100	-3%	-3
H ₂	100	0%	0

XCell CO H ₂ -RES Sensors			
Gas Applied	Concentration Applied (ppm)	CO H ₂ -RES Cross-Sensitivity	CO Reading**
CO	100	100%	100
H ₂ S	40	0%	0
SO ₂	9	-4%	-1
NO ₂	11	0%	0
NH ₃	25	0%	0
Cl ₂	10	0%	0
NO	50	130%	65
HCN	30	-5%	-2
Toluene	53	0%	0
Isopropanol	100	-8%	-8
H ₂	100	5%	5

XCell NO ₂ Sensors			
Gas Applied	Concentration Applied (ppm)	NO ₂ Cross-Sensitivity	NO ₂ Reading**
NO ₂	10	100%	10
CO	60	3.3%	2
SO ₂	10	-86%	-9
H ₂ S	20	-271%	-55
NH ₃	25	0%	0
O ₃	1	100%	1
HCN	4.7	2%	1
Acetylene	100	-1%	-1
H ₂	1000	-0.1%	-1
NO	50	3%	2
H ₂	100	0%	0

XCell NH ₃ Sensors			
Gas Applied	Concentration Applied (ppm)	CO H ₂ -RES Cross-Sensitivity	CO Reading**
NH ₃	25	100%	25
CO	45	0%	0
H ₂ S	20	75%	15
SO ₂	10	-39%	-4
NO ₂	2	-74%	-2
H ₂	1000	0%	0

XCell NO ₂ Sensors			
Gas Applied	Concentration Applied (ppm)	NO ₂ Cross-Sensitivity	NO ₂ Reading**
Cl ₂	10	100%	10
CO	45	0%	0
H ₂ S	20	-0.7%	-1
SO ₂	10	-34%	-4
NO ₂	2	19%	1
H ₂	1000	0%	0

* These cross-sensitivity values are intended for reference only and may change under varying environmental conditions, varying concentrations, varying sensor lots, and varying sensor age. These tables do not contain a complete or inclusive list of cross-sensitive gases, but rather is a sampling of the most common examples.

** All values have been rounded up to the nearest 1 ppm

*** Transient effect



Cross-Sensitivity Data (Non-XCell Exotic Sensors)

NO ₂ Sensors			
Gas Applied	Concentration Applied (ppm)	NO ₂ Cross-Sensitivity	NO ₂ Reading**
CO	300	0%	0
H ₂ S	15	-8%	-2
SO ₂	5	0%	0
NO	35	0%	0
Cl ₂	1	100%	1

ClO ₂ Sensors			
Gas Applied	Concentration Applied (ppm)	ClO ₂ Cross-Sensitivity	ClO ₂ Reading**
Alcohols	1000	0%	0
CO	100	0%	0
Cl ₂	1	60%	1
O ₃	0.25	280%	1
H ₂	3000	0%	0
H ₂ S	20	-25%	-5

PH ₃ Sensors			
Gas Applied	Concentration Applied (ppm)	PH ₃ Cross-Sensitivity	PH ₃ Reading**
AsH ₃	0.15	67%	1
SiH ₄	1	90%	1
B ₂ H ₆	0.3	35%	1
GeH ₄	0.6	92%	1
SO ₂	5	20%	1
H ₂	1000	0.1%	1
C ₂ H ₄	100	1%	1
CO	1000	0.1%	1

HCN Sensors			
Gas Applied	Concentration Applied (ppm)	HCN Cross-Sensitivity	HCN Reading**
H ₂ S	20	300%	60
NO ₂	10	-180%	-18
Cl ₂	10	12%	2
NO	50	1%	1
SO ₂	20	10%	2
CO	400	0.1%	1
H ₂	400	0.1%	1
C ₂ H ₄	80	0.1%	1
NH ₃	20	1%	1
CO ₂	50000	0.1%	50

NO Sensors			
Gas Applied	Concentration Applied (ppm)	NO Cross-Sensitivity	NO Reading**
CO	300	0%	0
SO ₂	5	0%	0
NO ₂	5	30%	2
H ₂ S	15	10%	2

* These cross-sensitivity values are intended for reference only and may change under varying environmental conditions, varying concentrations, varying sensor lots, and varying sensor age. These tables do not contain a complete or inclusive list of cross-sensitive gases, but rather is a sampling of the most common examples.

** All values have been rounded up to the nearest 1 ppm

Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice. MSA is a registered trademark of MSA Technology, LLC in the US, Europe, and other Countries. For all other trademarks visit <https://us.msasafety.com/Trademarks>.

MSA operates in over 40 countries worldwide. To find an MSA office near you, please visit [MSAsafety.com/offices](https://us.msasafety.com/offices).