



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

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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 (Two-Tox) Cross-Sensitivity	SO ₂ Reading**
SO ₂	10	100%	10
CO	60	0%	0
H ₂ S	20	0%	0
NO ₂	10	-90%	-9
NH ₃	25	0%	0
Cl ₂	10	0%	0
PH ₃	0.5	0%	0
HCN	11.2	45%	5
Isopropanol	500	0.4%	2
H ₂	1000	0.3%	3

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 Cl 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

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

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