

ALTAIR® 5X Multigas Detector

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. In some cases, these percentages are used to determine an approximate concentration of a gas other than the target.

In other cases, these percentages can be used to correct for possible errors in readings if one cross-sensitive gas is present together with the target gas.



MSA XCell® Electrochemical Sensor Cross-sensitivity Tables*

| XCell CO and CO H ₂ -RES Sensors For XCell CO/H ₂ S Sensor • XCell CO/H ₂ S -LC Sensor • XCell CO H ₂ -RES/H ₂ S Sensor | | |
|--|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| CO | 100 | 100% ⁽¹⁾ |
| H ₂ S | 40 | 0% |
| SO ₂ | 9 | -4% |
| NO ₂ | 11 | 0% |
| NH ₃ | 25 | 0% |
| CL ₂ | 10 | 0% |
| NO | 50 | 84% ⁽²⁾ |
| HCN | 30 | -5% ⁽³⁾ |
| Toluene | 53 | 0% |
| Isopropanol | 100 | -8% |
| H ₂ | 100 | 48% |
| H ₂ | 100 | <5% ⁽⁴⁾ |

⁽¹⁾ 50 ppm CO applied on CO XCell sensor => 50 ppm CO x 100% = 50 ppm CO displayed.

⁽²⁾ NO cross-sensitivity on XCell CO sensor is positive, 84%.
If 25 ppm NO in monitored air => [25 ppm NO x 84%]
= approximately 21 ppm CO displayed while no CO present in monitored air.
If 25 ppm NO & 25 ppm CO in monitored air => [25 ppm NO x 84%] + [25 ppm CO]
= 21 + 25 = approximately 46 ppm CO displayed

⁽³⁾ HCN cross-sensitivity on XCell CO sensor is negative, -5%.
If 20 ppm HCN in monitored air => [20 ppm HCN x -5%]
= approximately -1 ppm CO displayed while no CO present in monitored air.
If 20 ppm HCN & 25 ppm CO in monitored air => [20 ppm HCN x -5%] + [25 ppm CO]
= (-1) + 25 = approximately 24 ppm CO displayed

⁽⁴⁾ Note the great performance of our new XCell CO H₂-RES sensor which has a very low cross-sensitivity to H₂ of only <5% (vs 48% for the standard CO sensor). This sensor is perfect for OGP, Steel and any industry where H₂ could be present while detecting CO, eg battery rooms where lead-acid batteries are stored (Power Plants, Shipping, Telecommunications...).

| XCell H ₂ S and H ₂ S-LC Sensors For XCell CO/H ₂ S Sensor • XCell CO/H ₂ S-LC Sensor • XCell CO H ₂ -RES/H ₂ S Sensor | | |
|--|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| CO | 100 | 1% |
| H ₂ S | 40 | 100% |
| SO ₂ | 9 | 14% |
| NO ₂ | 11 | -1% |
| NH ₃ | 25 | -1% |
| CL ₂ | 10 | -14% |
| NO | 50 | 25% |
| HCN | 30 | -3% |
| Toluene | 53 | 0% |
| Isopropanol | 100 | -3% |
| H ₂ | 100 | 0% |

| XCell Oxygen (O ₂) Sensor | |
|---------------------------------------|---------------------------------|
| Gas applied | Approximate % cross-sensitivity |
| O ₂ | 100% |

| XCell NH ₃ Sensor | | |
|------------------------------|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| NH ₃ | 25 | 100% |
| CO | 45 | 0% |
| H ₂ S | 20 | 75% |
| SO ₂ | 10 | -39% |
| NO ₂ | 2 | -74% |
| H ₂ | 1000 | 0% |

Because every life has a **purpose...**



| XCell SO ₂ Sensor | | |
|------------------------------|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| CO | 1000 | 0% |
| H ₂ S | 199 | 0.1% |
| SO ₂ | 24.5 | 100% |
| NO ₂ | 10 | -80% |
| NH ₃ | 121 | -0.1% |
| Cl ₂ | 15.3 | 0.7% |
| PH ₃ | 5 | 18% |
| HCN | 50.4 | 5% |
| Isopropanol | 500 | 0% |
| H ₂ | 2000 | 1% |

| XCell CL ₂ Sensor | | |
|------------------------------|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| Cl ₂ | 10 | 100% |
| CO | 45 | 0% |
| H ₂ S | 20 | -0.7% |
| SO ₂ | 10 | -34% |
| NO ₂ | 2 | 19% |
| H ₂ | 1000 | 0% |

20mm Electrochemical Sensor Cross-sensitivity Tables*

| NO ₂ Sensor | | |
|------------------------|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| CO | 300 | 0% |
| H ₂ S | 15 | -8% |
| SO ₂ | 5 | 0% |
| NO | 35 | 0% |
| Cl ₂ | 1 | 100% |

| ClO ₂ Sensor | | |
|-------------------------|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| Alcohols | 1000 | 0% |
| CO | 100 | 0% |
| Cl ₂ | 1 | 60% |
| O ₃ | 0.25 | 280% |
| H ₂ | 3000 | 0% |
| H ₂ S | 20 | -25% |

| PH ₃ Sensor | | |
|-------------------------------|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| AsH ₃ | 0.15 | 67% |
| SiH ₄ | 1 | 90% |
| B ₂ H ₆ | 0.3 | 35% |
| GeH ₄ | 0.6 | 92% |
| SO ₂ | 5 | 20% |
| H ₂ | 1000 | 0.1% |
| C ₂ H ₄ | 100 | 1% |
| CO | 1000 | 0.1% |

| HCN Sensor | | |
|-------------------------------|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| H ₂ S | 20 | 25% |
| NO ₂ | 10 | -180% |
| Cl ₂ | 10 | 12% |
| NO | 50 | 1% |
| SO ₂ | 20 | 10% |
| CO | 400 | 0.1% |
| H ₂ | 400 | 0.1% |
| C ₂ H ₄ | 80 | 0.1% |
| NH ₃ | 20 | 1% |
| CO ₂ | 50000 | 0.1% |

| NO Sensor | | |
|------------------|-----------------------------|---------------------------------|
| Gas applied | Concentration applied (ppm) | Approximate % cross-sensitivity |
| CO | 300 | 0% |
| SO ₂ | 5 | 0% |
| NO ₂ | 5 | 30% |
| H ₂ S | 15 | 10% |

* Please note: 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.