Ozone Sensor

Gas Cross Sensitivity Data

Aeroqual ozone sensors may exhibit a response to gases other than the target gas. Typical sensor responses to other gases are shown in the tables below. The response is an average expected cross-sensitivity and may vary for an individual sensor.

Low Ozone Sensor

GAS	Sensor Reading/ppm
Ammonia 25 ppm	-0.02
Butane 1000 ppm	0
Carbon monoxide 100 ppm	0
Carbon dioxide 1000 ppm	0
Chlorine 0.5 ppm	0.2
Ethanol 20 ppm	-0.02
Ethyl acetate 100 ppm	-0.02
Heptane 100 ppm	0
Hydrogen sulfide 4 ppm	-0.1
Isopropanol 20 ppm	0
Methane 5000 ppm	0
Nitrogen dioxide 0.5 ppm	0.1
Ozone 0.3 ppm	**0.3**
Perchloroethylene 50 ppm	0
Propane 5000 ppm	0
Sulfur dioxide 10 ppm	0
Toluene 50 ppm	0

High Ozone Sensor

GAS	Sensor Reading/ppm
Ammonia 25 ppm	-10
Butane 1000 ppm	0
Carbon monoxide 100 ppm	0
Carbon dioxide 1000 ppm	0
Chlorine 0.5 ppm	0.5
Ethanol 20 ppm	-0.5
Ethyl acetate 100 ppm	-0.5
Heptane 100 ppm	0
Hydrogen sulfide 4 ppm	-1
Isopropanol 20 ppm	-0.5
Methane 5000 ppm	0
Nitrogen dioxide 0.5 ppm	0.5
Ozone 1 ppm	**1**
Perchloroethylene 50 ppm	0
Propane 5000 ppm	0
Sulfur dioxide 10 ppm	0
Toluene 50 ppm	0

Notes:

- The Aeroqual low concentration ozone head sensor (0 to 0.5 ppm) incorporates a unique background compensation mechanism which reduces the cross-sensitivity to many gases including chlorine, nitrogen dioxide and hydrocarbons.
- The accuracy of the Aeroqual ozone reading in the presence of cross-sensitive gases will be a function of the concentration the gas.
- Volatile Organic Compounds (VOCs) are sometimes present in applications and can produce cross-sensitive readings. The term "VOC" applies to a very wide range of hydrocarbons with different behaviours. For example, VOCs such as ethanol and methanol may cause a lower reading than normal at low concentrations while isopropanol and toluene do not have a strong effect. At high concentrations of VOCs the sensor background compensation may become overwhelmed and the reading lower than actual. Users should also be aware that measurements of ozone in the presence of high concentrations of VOCs, particularly alkenes, may be lower than expected due to gas phase ozone reaction with the VOC.
- Aeroqual advises careful sensor placement to avoid/reduce exposure to cross-sensitive gases.

Measuring Ozone in Air

Many applications require measurement and control of very low ozone concentrations below 300 parts per billion. At such low concentrations, you need to consider the following sampling issues to successfully measure and control ozone.

- ***Ozone is highly reactive***. Ozone will rapidly react with organic materials and surfaces such as walls, flooring, plastic testing chambers and people. The greater the accuracy of the ozone monitor, the more such variations in ozone concentration will become apparent. If you are testing the accuracy of ozone monitors in test chambers, ensure the chamber and devices inside the chamber are clean and non-reactive, e.g. glass or a fluoropolymer.
- ***Ozone will react with dust and oils***. Do not use dusty and dirty air inlets as they will lower the measured ozone concentration.
- ***Ozone concentration gradients are common*** *in rooms and are greatly influenced by air movement and mixing*. This is more pronounced at concentrations below 100 parts per billion). High accuracy ozone monitors will detect differences in ozone concentrations and variations with time. Use monitors with Min/Max/Average measurement cycles to reduce the effect of these fluctuations.
- Aeroqual's ozone monitors are designed with ***active sampling*** to maximize air sampling at the sensor (to minimize ozone losses). Most expensive, analytical instruments also employ active sampling (e.g. UV photometry).
- Products without *active sampling* (electrochemical and conventional HMOS products) will normally under-read ozone concentrations below 200 parts per billion and struggle with sensitivity and accuracy, particularly in low air flow.
- *Active sampling* requires air to be blown or pumped to the sensor under precise flow conditions. Aeroqual fan based monitors are designed to be held at right angles to any direct stream being measured. **Avoid forcing pressurized air into active sampling monitors.**
- Air inlets are manufactured from cleaned stainless steel mesh and fluoropolymer materials to minimize ozone loss. **Do not use sampling tubing:**
    - that alters flow characteristics,
    - that reacts with ozone,
    - longer than 1 foot or 30 cm on pumped based monitors without PTFE filters, e.g. centralized monitoring systems.