	Technical Note	March 2012
CROWCON Gas Detection You Can Trust	***SO2 and NH3 Sensor cross sensitivity and inhibition guidance and warnings*** **GEN030**	

Product: Tetra, Tetra 3 and Gasman
Subject: SO2 (4S) and NH3 (NH3 3E 100 SE) Sensor cross sensitivity and inhibition guidance and warnings

(Electrochemical toxic sensors)

Introduction:

Toxic sensors are designed and built to demonstrate an optimum response to the target gas. However, interfering gases in the environment can affect the reading given. The information contained in this note has been collated to offer guidance and explain these cross sensitivities.

Crowcon regularly review the sensors available in the market, and focus on using the best possible solutions, many with active filters that assist in both reducing the possibility of poisoning and limiting cross sensitive response.

What is cross sensitivity?

There are a number of forms of cross sensitivity, and more than one can be applicable:

1. Interference readings causing false alarms or no alarm
    i. Positive response to a non target gas, causes a positive response
    ii. Negative response to a non target gas, causes a negative response
2. Inhibited response for a timeframe after exposure without causing long term damage
3. Poisoning which renders the sensor inoperable

Cross sensitivities can differ depending on the ambient temperature and level of gas the sensor is being exposed to. The information below is provided as a guide, and a thorough risk assessment to understand the potential gases in the environment is always recommended.

<u>Sulphur Dioxide (SO2) and Ammonia (NH3)</u>

In normal practice T10 is less than 10 seconds and T90 for the SO2 sensor is 30 seconds when exposed to 10ppm SO2 at 0.5 Lt/min

Testing has shown that the SO2 sensor is inhibited by NH3 and it takes over 24 hours to recover.

T10 is greater than 140 seconds even after 4+ hours
T90 is greater than 3 minutes even after 4+ hours
T10 is greater than 25 seconds after 24 hours
T90 is greater than 110 seconds after 24 hours

(T10 is the time for the sensor reading to reach 10% of the gas applied)
(T90 is the time for the sensor reading to reach 90% of the gas applied)

It is therefore not recommended to use a SO2 sensor if it has been exposed to NH3 and detecting SO2 at the same time or within the next 24 hours.

Additionally testing has shown that the NH3 sensor has a negative response to SO2 and therefore will not detect NH3 correctly if also exposed to SO2 at the same time, once exposure to SO2 has been removed the NH3 sensor will respond to NH3 correctly and immediately without any recovery time.

Crowcon Technical Support

Copyright© 2009 Crowcon Detection Instruments. Ltd. All rights reserved
Approved: CW
Date: *March 2012*