Critical Environment Technologies™

SAFER AIR EVERYWHERE.

GAS DETECTION – BUMP TESTING AMMONIA (NH_3) SENSORS

Bump testing a gas sensor involves flowing a concentration of gas that is slightly higher than the Low alarm setpoint of the gas detector for a short period of time (1-2 minutes or less). The purpose of a bump test is to confirm that the sensor responds to the presence of gas, the low alarm will activate and the gas detector overall is operating appropriately. The bump test is used to confirm that your life saving gas alarm device is working correctly. A bump test does not measure the accuracy of the sensors or its state of calibration.

Electrochemical toxic gas sensors tend to output "0" in clean air and "0" when they have expired so it is important to bump test a sensor for critical applications to ensure the sensor has not expired. If at any time the NH_3 sensor has been exposed to an undetermined amount of NH_3 a bump test should be performed.

Keep a Log

An important part of the bump test process is keeping a record of the readings. A consistent bump test schedule with recorded results can help you monitor the overall health of the sensor and the gas detection system in general. It can alert you to inconsistencies which may indicate that the detector is not performing properly and requires further attention. Attached is a maintenance log template for your convenience (see other side).

Increasing the Lifespan of Ammonia Sensors

CETCI's Ammonia sensors have a lifespan of approximately 2 years in air. To take full advantage of the operational lifespan of the sensor, it is important to understand how the gas concentration and the length of time of exposure affect the sensor. Regular exposure and long-term exposure to very low levels of ammonia over time will consume (reduce the lifespan) of the sensor. Exposure to very high concentrations of ammonia can kill the sensor leaving it useless for detection. Therefore, it is important to use a lower concentration of NH_3 gas for bump testing.

Depending on what concentration of NH_3 you are using for the bump test, the length of time you will be applying the NH_3 should change. In most cases the Low alarm setpoint is either 25 ppm or 35 ppm. To perform a bump test, you will need a test gas that exceeds this low alarm point. There are three common concentrations of NH_3 gas that are available: 50 ppm, 100 ppm, 300 ppm. For each of these you should use a different length of time for the exposure of the gas to the sensor.

Example 1: If the Low alarm setpoint for NH_3 is 25 ppm and the bump test gas concentration is 50 ppm, it could take up to approximately 2 minutes to trip the Low alarm for a sensor of moderate age.

Example 2: If the Low alarm setpoint for NH_3 is 25 ppm the bump test gas concentration is 300 ppm, it could take as little as 10 seconds to trip the Low alarm for a sensor of moderate age.

In both cases your goal is to trip the Low alarm, but also reduce the exposure to the gas. Best practice is to remove the gas as soon as the alarm trips.

Minimum Recommendations

Bump tests should be done once a month. If a bump test fails, a full calibration should be done. Otherwise, a full calibration should be done every 6 months. The sensor should be replaced every 2 years or more frequently depending on if the sensor has been exposed to high or prolonged concentrations of ammonia and/or it is not functioning as it should.

Monthly Bump Test Schedule - Ammonia (NH_3)

System Location _____

Transmitter Model# _____ Transmitter Serial# _____

Low Alarm Setpoint _____

Bump Test Date	Gas Concentration Used	Time Until Low Alarm	Gas Sensor Reading	Notes

Notes:
When using 300 ppm, response should be within 15 to 30 seconds; 100 ppm, within 1 min; 50 ppm, within 2 min. Make mental note of the reading and the length of time and remove the gas as soon as alarm responds. Record th