

ORNL

INSTRUMENT EVALUATION SUMMARY

Eberline Alpha 6A Alpha Air Monitor

Description: The Eberline Alpha 6A is a solid state detector based continuous alpha air monitor. The Alpha 6 uses a multi-channel analyzer to determine airborne alpha activity.

Ranges Tested: N/A

Report Date: April 8, 1996

General Comments:

1. Test data was obtained by reading the region of interest history file or by viewing the LCD.

RADIATION RESPONSE

Probe Surface Sensitivity: N/A

ELECTRONIC and MECHANICAL REQUIREMENTS and TESTS

Line Noise: Not performed

INTERFERING RESPONSES TEST RESULTS

Radio Frequency/Microwave: Response abnormalities were observed during the frequency scan of 0.3 to 35 MHz at 50 volts/meter. Sudden sharp increases or decreases that would conclusively indicate susceptibility were not observed. This indicated that each abnormality could have been due to the level of radiation used to test the Alpha 6. Both instruments had acceptable mean results when exposed to the 140 MHz field at 50 volts/meter. One Alpha 6 was erratic throughout the test.

Microwave Fields: Both Alpha 6s tested went out-of-tolerance high when exposed to 915 MHz at 0.4 Watts/meter². When re-checked, one of the units was acceptable. One of the two units tested was acceptable when exposed to the 2.45 GHz field at 2.0 Watts/meter². The other unit went out-of-tolerance high.

Electric Fields: Results were acceptable for all instruments when exposed to the electrostatic field (5000 volts/meter), and 60 and 400 Hz electric fields at 100 volts/meter.

Magnetic Fields: Results were acceptable from each Alpha 6 tested when exposed to 10 Gauss (10 Oersted) DC and 60 Hz (1.26 Gauss) AC magnetic fields.

Interfering Ionizing Radiations: Not performed.

ENVIRONMENTAL FACTORS

Temperature: One Alpha 6 was acceptable when exposed to temperatures from -10 to 50 °C (+14 to +122 °F). All means obtained were within the tolerance limits. Readings obtained at 50 and -10 °C were somewhat erratic which resulted in inconclusive results at these temperatures. The other Alpha 6 was acceptable at temperatures from 22 to 40 °C (72 to 104 °F). It became erratic and had inconclusive results at 50, 10, and -10 °C with average readings being out-of-tolerance low. It was out-of-tolerance low at 0 °C.

Temperature Shock: Both Alpha 6s were somewhat erratic throughout the test. On one instrument, mean readings were acceptable when exposed to temperature changes of 22 to 50, 50 to 22, and 22 to -10 (°C). When exposed to a temperature change of -10 to 22, the instrument went out-of-tolerance low until 45 minutes after the change occurred. The other Alpha 6 was out-of-tolerance low 60 minutes after being exposed to a temperature change from 50 to 22 °C, and 15 minutes after the temperature change from 22 to -10 °C. This same instrument went low after being exposed to the 22 to -10 °C change and did not recover until after the test was complete.

Humidity: Both instruments tested went out-of-tolerance low at 95% relative humidity at 22 ± 2 °C. One instrument remained low upon return to 40% RH.

Vibration: Not performed.