

ORNL TYPE TEST REPORT

Ludlum Model 12 with a 43-5 Alpha Scintillation Probe

Description: The model 12 is a general-purpose count rate meter. The units tested were combined with 43-5 ZnS alpha scintillation probes. The model 12 has four ranges of operation, X 1 (0 - 500 cpm), X 10 (0 - 5000 cpm), X 100 (0 - 50000 cpm), and X 1000 (0 - 500000 cpm).

Ranges Tested: X 1 and X 10

General Comments:

1. Readings on the X 1 range were somewhat erratic due to the level of radiation required to test the range. The X 10 range was less erratic, and both were considered normal unless stated otherwise.

ELECTRONIC and MECHANICAL REQUIREMENTS and TESTS

INTERFERING RESPONSES TEST RESULTS

Radio Frequency Fields: The X 10 range was acceptable for each test frequency. When testing the X 1 range, response abnormalities were observed during the 0.3 to 35 MHz frequency scan test and at 140 MHz. Frequency intensity was 50 volts/meter.

Microwave Fields: The X 1 and X 10 ranges were acceptable when exposed to 915 MHz. The X 10 range was acceptable when exposed to 2.45 GHz. Low readings were observed on one instrument operating on the X 1 range when exposed to 2.45 GHz. The intensity of the 915 MHz frequency was 0.4 watts/meter² and 2.0 watts/meter² for the 2.45 GHz frequency.

Electric Fields: The X 10 range was acceptable when exposed to electrostatic (5000 volts/meter), and 60 and 400 Hz (100 volts/meter). Response abnormalities were observed at each test field when operated using the X 1 range.

Magnetic Fields: Susceptible to the 10 Gauss (10 Oersted) field on each range tested.

Interfering Ionizing Radiations:

ENVIRONMENTAL FACTORS

Temperature: Acceptable at temperatures $> -10\text{ }^{\circ}\text{C}$ ($14\text{ }^{\circ}\text{F}$) and $< +30\text{ }^{\circ}\text{C}$ ($86\text{ }^{\circ}\text{F}$) when operated using the X 1 range. Acceptable at temperature $> -10\text{ }^{\circ}\text{C}$ and $\leq +50\text{ }^{\circ}\text{C}$ ($14\text{ }^{\circ}\text{F}$ and $122\text{ }^{\circ}\text{F}$) when operated using the X 10 range..

Temperature Shock: In general, the Model 12 exhibited response abnormalities when exposed to rapid temperature changes. Specific information may be obtained by reviewing the temperature shock test report.

Humidity: Results were acceptable over the test range of 40% to 95% relative humidity. One instrument had a high mean response after returning from 95% to 40% when operated in the X 1 range. The other three instruments tested were acceptable.

Ambient Pressure: The X 10 range was acceptable over the test range of 525 mmHg to 795 mmHg (20.66 inHg to 31.3 inHg). The X 1 range was acceptable at pressures $> 690\text{ mmHg}$ (27.16 inHg) and $\leq 795\text{ mmHg}$ (31.3 inHg).

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