UNCOMPENSATED IONIZATION CHAMBER TYPES WL-6941 AND WL-6941A

The WL-6941 and WL-6941A are aluminum cased ionization chambers designed to detect thermal neutrons in the flux range from $5 \times 10^5$ to $5 \times 10^{10}$ neutrons/cm²/second. Ionization currents are produced in the nitrogen-argon atmosphere by fission fragments resulting from thermal neutrons incident on the sensitive coating, consisting of uranium oxide highly enriched in U-235 isotope. The neutron sensitivity of these types is $2.6 \times 10^{-14}$ amperes/neutron/cm²/second and the gamma sensitivity is $3 \times 10^{-11}$ amperes/Roentgen/hour. These tubes are provided with a type "HN" connector and are extremely rugged being operable in any position.

The WL-6941 may be operated or stored in ambient temperatures not exceeding 175°F; similarly, the maximum ambient temperature for the WL-6941A is 300°F.

MECHANICAL:
- Maximum Diameter: 2-3/32 Inches
- Maximum Overall Length: 11-7/8 Inches
- Approx. Sensitive Length: 6 Inches
- Net Weight: 1-3/4 Pounds
- Shipping Weight: 12 Pounds

MATERIALS:
- Body: Aluminum
- Insulation: Polystyrene & Alumina
- Gas Filling: Argon-Nitrogen Mixture at 76 cm Hg
- Neutron Sensitive Coating: Content: U₃O₈ enriched to more than 90% in U-235
- Thickness: 2.0 mg/cm²
- Total Amount of U-235: 0.4 gm

MAXIMUM RATINGS:
- Absolute Maximum Values
  - Interalcathode Voltage (dc): 1000 max. Volts
  - Thermal Neutron Flux: $5 \times 10^{10}$ max. n/cm²/sec
  - Total Integrated Flux: $1 \times 10^{14}$ max. n/cm²(nvt)
- Ambient Temperature:
  - WL-6941: 175 max. °F
  - WL-6941A: 300 max. °F

TYPICAL OPERATING CHARACTERISTICS:
- Voltage Between Electrodes: 300 to 800 Volts
- Neutron Flux Range: 5 to $10^{10}$ n/cm²/sec
- Neutron Sensitivity: $2.6 \times 10^{-14}$ amp/n/cm²/sec
- Gamma Sensitivity: $3 \times 10^{-11}$ amp/R/hr
- Leakage Resistance: 10⁹ min. ohms
- Capacitance Signal: Electrode to Case: 180 µuf

TYPICAL SATURATION CHARACTERISTICS:
- For Thermal Neutron Flux of $3 \times 10^{10}$ n/cm²/sec
  - Operating Voltage: 200 min. Volts
  - Output Current: $6 \times 10^{-5}$ Amperes
- For Thermal Neutron Flux of $2.5 \times 10^{10}$ n/cm²/sec
  - Operating Voltage: 800 min. Volts
  - Output Current: $6.5 \times 10^{-5}$ Amperes

- Saturation voltage varies with neutron flux.
- Lower level limited by alpha background current of approximately $3 \times 10^{-5}$ amperes.
- The WL-6941 and WL-6941A have passed Military Specifications MIL-S-901 for shock and MIL-Std-167 (Type 1) for vibration.

NOTE: These tubes may not be immersed in water and high humidity environments should be avoided since they may impair performance.

Neutron & Radiation Detector Section

WESTINGHOUSE ELECTRIC CORPORATION, ELECTRONIC TUBE DIVISION, E. MIRA, NEW YORK

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TYPICAL SATURATION CHARACTERISTIC

Thermal Neutron Flux approx. $3 \times 10^9$ nv.
Variation in output is less than 1% throughout integrated thermal neutron flux exposures up to $5 \times 10^{16}$ nvt.