

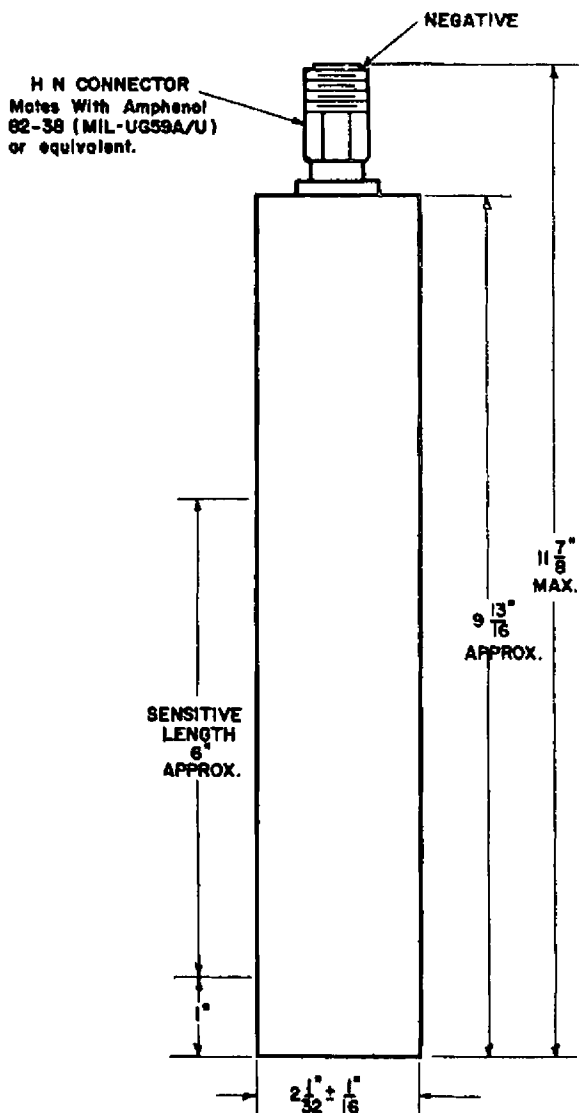
February 24, 1958

FISSION COUNTER TYPE WL-7187

The WL-7187 is a fission counter designed to detect thermal neutrons in the flux range from 1.25×10^7 to 1.25×10^8 neutrons/cm²/second. Ionization pulses are produced in the nitrogen-argon atmosphere by fission fragments resulting from thermal neutrons incident on the sensitive coating. The sensitive coating consists of uranium oxide highly enriched in U-235 isotope. The WL-7187 is extremely rugged. †

The characteristics of the WL-7187 are such that sensitivity to changes in the setting of the discriminator pulse height selector is minimized. This attribute makes the tube desirable in critical facilities where its high gamma sensitivity will not impair accuracy of readings. In this application, the WL-7187 permits good day-to-day reproducibility of readings.

The sensitivity of the WL-7187 is 5.2×10^{-1} counts/neutron/cm² when the pulse amplifier discriminator is adjusted for a background counting rate of 5 counts/second for the naturally radioactive uranium. An incident gamma flux of 10^{10} photons/cm²/second results in a maximum decrease in sensitivity of 3% up to 10^5 counts/second.



CE-A1253

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 and Electrodes	Aluminum
Insulation	Polystyrene & Alumina
Neutron Sensitive Coating:	
Content	U ₃ O ₈ enriched to more than 90% in U-235
Thickness	1.0 mg/cm ²
Total Amount of U-235	0.86 gm
Gas Filling	Argon-Nitrogen Mixture at 220 cm Hg

MAXIMUM RATINGS:

Absolute Maximum Values		
Voltage Between Electrodes	800 max.	Volts
Thermal Neutron Flux	2.5×10^{10} max.	n/cm ² /sec
Total Integrated Neutron Flux	1×10^{17} max.	n/cm ²
Temperature	300 max.	°F

TYPICAL OPERATING AS A FISSION COUNTER:

Operating Voltage	300	Volts
Operating Voltage Plateau [Ⓔ]	200 to 800	Volts
Neutron Flux Range	1.25×10^7 to 1.25×10^8	n/cm ² /sec
Sensitivity [□]	5.2×10^{-1}	count/n/cm ²
Output Pulse Characteristics:		
Magnitude	2×10^{-4}	Volts
Inherent Rise Time	2×10^{-7} max.	Seconds
Leakage Resistance	10^9 min.	ohms
Capacitance-Signal Electrode to Case	190	uuf

† The WL-7187 has passed Military Specification MIL-S-901 for shock and MIL-Std-167 (Type I) for vibration.

Ⓔ Counting Rate at different operating voltages is shown in CE-A1358.

□ The sensitivity is 5.2×10^{-1} counts/n/cm² for an alpha background counting rate of 5 count/sec. By varying the pulse-height selector setting, other counter sensitivities are obtainable for different background counting rates as shown in CE-A1359.

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