

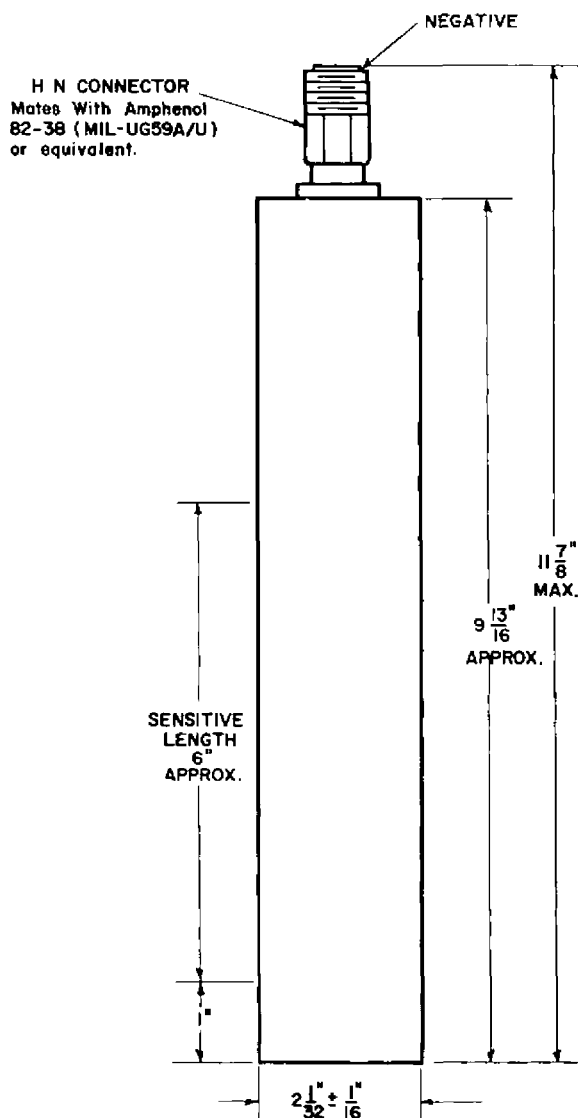
April 10, 1958

FISSION COUNTER TYPES WL-6971 AND WL-6971A

The WL-6971 and WL-6971A are fission counters designed to detect thermal neutrons in the flux range from 1.25×10 to 1.25×10^6 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 enriched to 20% in U-235 isotope. These types are extremely rugged and will operate in any position.

The WL-6971 may be operated or stored in ambient temperatures not exceeding 175°F; similarly, the maximum ambient temperature for the WL-6971A is 300°F.

The sensitivity of the WL-6971 and WL-6971A is 1.4×10^{-1} counts/neutrons/cm² when the pulse amplifier discriminator is adjusted for a background counting rate of 1 count/second for the naturally radioactive uranium. An incident gamma flux of 10^{10} photons/cm²/second results in a maximum decrease in sensitivity of 1% 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 20% in U-235
Thickness	2.0 mg/cm ²
Total Amount of U-235	0.37 gm
Gas Filling	Argon-Nitrogen Mixture at 76 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:		
WL-6971	175 max.	°F
WL-6971A	300 max.	°F

TYPICAL OPERATING CHARACTERISTICS:

Operating Voltage	300	Volts
Operating Voltage Plateau [†]	200 to 800	Volts
Neutron Flux Range	1.25×10 to 1.25×10^6	n/cm ² /sec
Sensitivity [□]	1.4×10^{-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	150	puf

† The WL-6971 and WL-6971A have passed Military Specifications MIL-S-901 for shock and MIL-Std-167 (Type I) for vibration.

‡ Counting Rate at different operating voltages is shown in CE-A1326.

□ The sensitivity is 1.4×10^{-1} counts/n/cm² for an alpha background counting rate of 1 count/sec. By varying the pulse-height selector setting, other counter sensitivities are obtainable for different background counting rates as shown in CE-A1327.

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

