GE
Measurement & Control

Reuter Stokes Fission Counter RS-P6-0805-134

Neutron Counting in a High Gamma Flux

This fission counter is operable in high gamma flux applications ($<10^6$/R/hr). Due to the high neutron-to-gamma signal ratio in these applications, the large fission pulses permit discrimination against gamma pulses and pulse pile-up. B-10 lined counters and He-3 counters are usable in a gamma flux of 10^3 and (1-10) R/hr respectively.

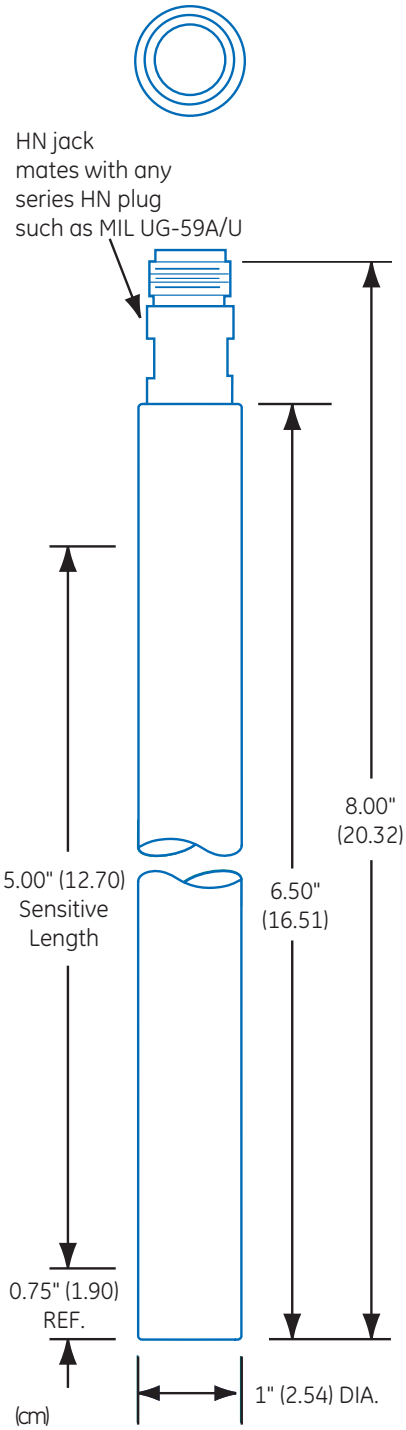
In all applications, the inherent low sensitivity (0.14 cps/nv in 0 R/hr) must be weighed against the advantage of satisfactory performance in a high gamma environment. Performance is greatly dependent on associated electronics when operating in a high gamma flux. High count-rate electronics are required for optimum performance.

Smart Construction

The fission counter is constructed of aluminum alloy for minimum neutron absorption and residual activity. All seals are ceramic-to-metal and insulators are high purity alumina.

Sample Specifications

This proportional counter is a sample of one of over 10,000 neutron counter designs we have manufactured. Please contact us if your application requires modification of the specifications given here.



Specifications

Mechanical

- Maximum diameter: 2.62 cm
- Maximum overall length: 20.32 cm
- Connector type: HN

Material

- Outer shell and inner electrodes: Aluminum
- Connector: Aluminum
- Insulation:
  - — Detector: Alumina ceramic
  - — Connector: Alumina ceramic
- Neutron sensitive material: Uranium enriched 93% in U-235
- Total quantity of U-235: 12 mg
- Fill gas: 76 cm Hg – Argon/Nitrogen

Capacitance

- 40 pf

Resistance @ 25°C

- 10^{12} ohms (minimum)

Maximum Ratings

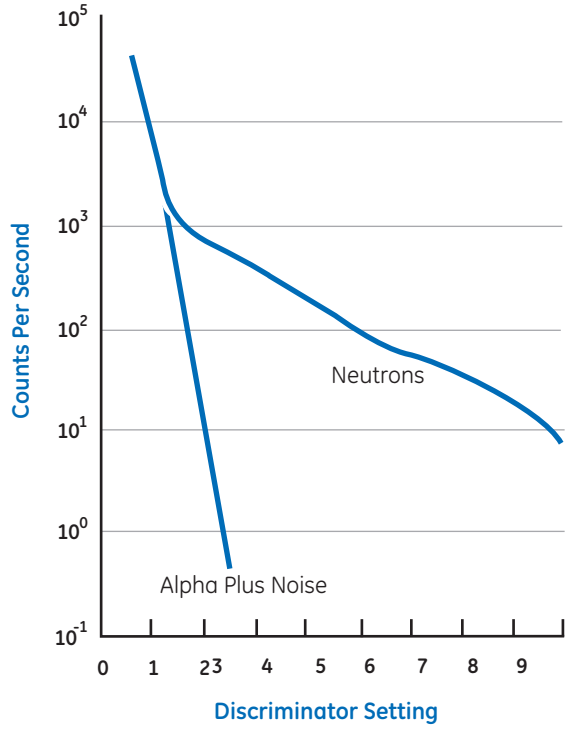
- Voltage: 800 V
- Temperature: 300°C
- Burn-up life for 10% decrease in sensitivity: 2×10^{20} nvt (thermal)

Typical Operating Characteristics

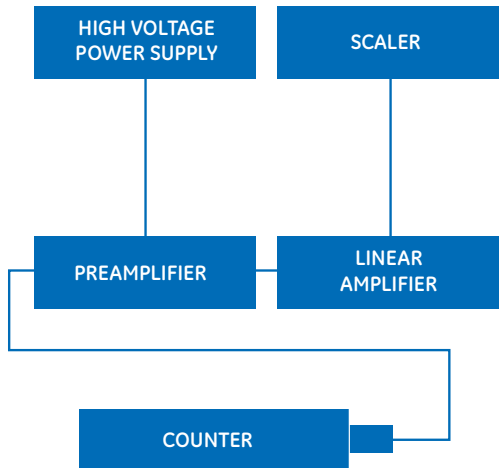
- Thermal neutron sensitivity (see note): 0.14 cps/nv ±20%
- Thermal neutron flux range: to 10^6 nv
- Voltage range: 300-800 volts
- Output pulse characteristics (average)
  - — Charge output: 3×10^{-15} coulombs
  - — Collection time: ≤200 nanoseconds

Note: The sensitivity is measured with alpha background count rate from uranium plating at <1 cps. Sensitivity values are not adjusted for perturbation.

Integral Bias Curve (Voltage 800 vdc)



Typical Connection Diagram



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