

Reuter Stokes Fission Counter  
RS-P6-0805-134

fact sheet

Neutron Counting in a High Gamma Flux

This fission counter is operable in high gamma flux applications (<math>10^6</math> 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.

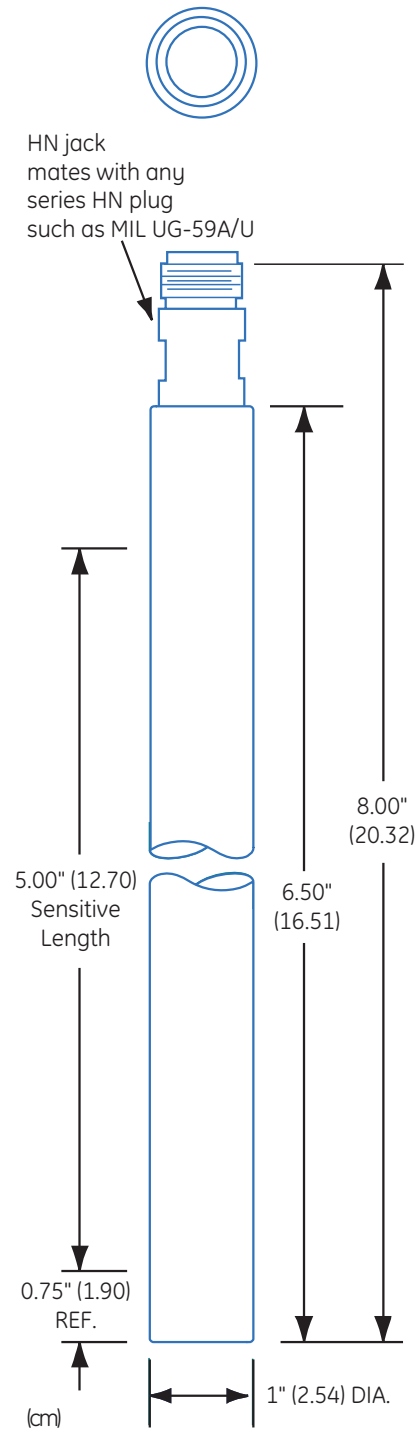
In all applications, the inherent low sensitivity (0.14 cps/nv in 0 R/hr) must be weighed against the advantage of satisfactory performance in a high gamma environment. Performance is greatly dependent on associated electronics when operating in a high gamma flux. High count-rate electronics are required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

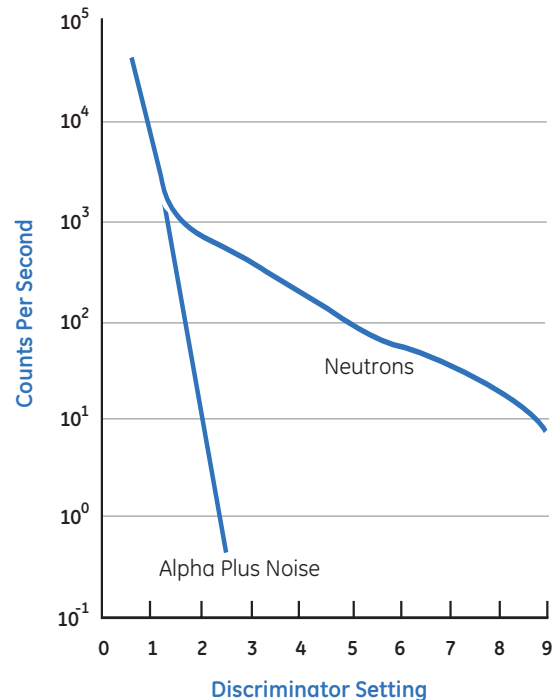
- Voltage: 800 V
- Temperature: 300°C
- Burn-up life for 10% decrease in sensitivity:
  - $2 \times 10^{20}$  nvt (thermal)

### Typical Operating Characteristics

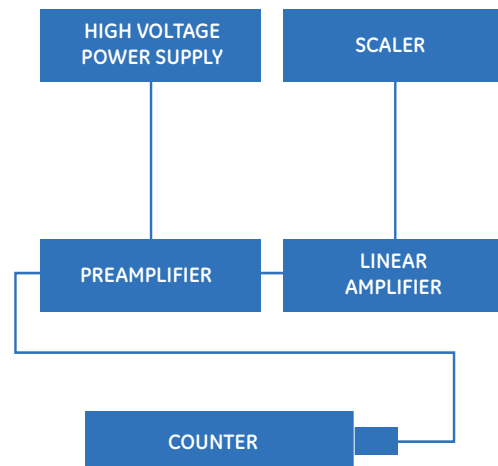
- Thermal neutron sensitivity (see note): 0.14 cps/nv  $\pm 20\%$
- Thermal neutron flux range: to  $10^6$  nv
- Voltage range: 300-800 Volts
- Output pulse characteristics (average)
  - Charge output:  $3 \times 10^{-15}$  coulombs
  - Collection time:  $\leq 200$  nanoseconds

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



### Cable: Low-Noise Coax

8499 Darrow Road  
 Twinsburg, OH 44087  
 Ph: 1 (330) 425-3755  
 Ph: 1 (512) 251-4131  
 E-mail: [rsweb@ge.com](mailto:rsweb@ge.com)  
[gepower.com/reuterstokes](http://gepower.com/reuterstokes)

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