



## Helium-3 neutron detectors for homeland security radiation portal monitors

Radiation portal monitors operate in harsh environments. It is essential that these monitors maintain a very tight level of detection performance across broad temperature ranges, shock, and vibration levels. Reuter-Stokes has designed this series of detectors specifically for use in such challenging environments

The  $^3\text{He}$  based detectors for radiation portal monitors are two inch diameter detectors and are available in standard lengths from two feet to six feet (active length) with an HN connector (MHV and SHV optional). Additional lengths, diameters, and connector configurations are available on request.

**Find the detector with the closest specifications to meet your needs using our Helium-3 Product Configurator at: [reuter-stokes.com/helium-3](http://reuter-stokes.com/helium-3)**

Reuter-Stokes' detectors are recognized across the industry as possessing the quality and dependability required to help you meet the performance standards of the homeland security market.

By streamlining the design, manufacturing, and supply chain processes, Reuter-Stokes is able to offer a high quality radiation detector, complete with our expert technical application support and an industry-leading warranty, at a price that will help ensure your portals are cost competitive.

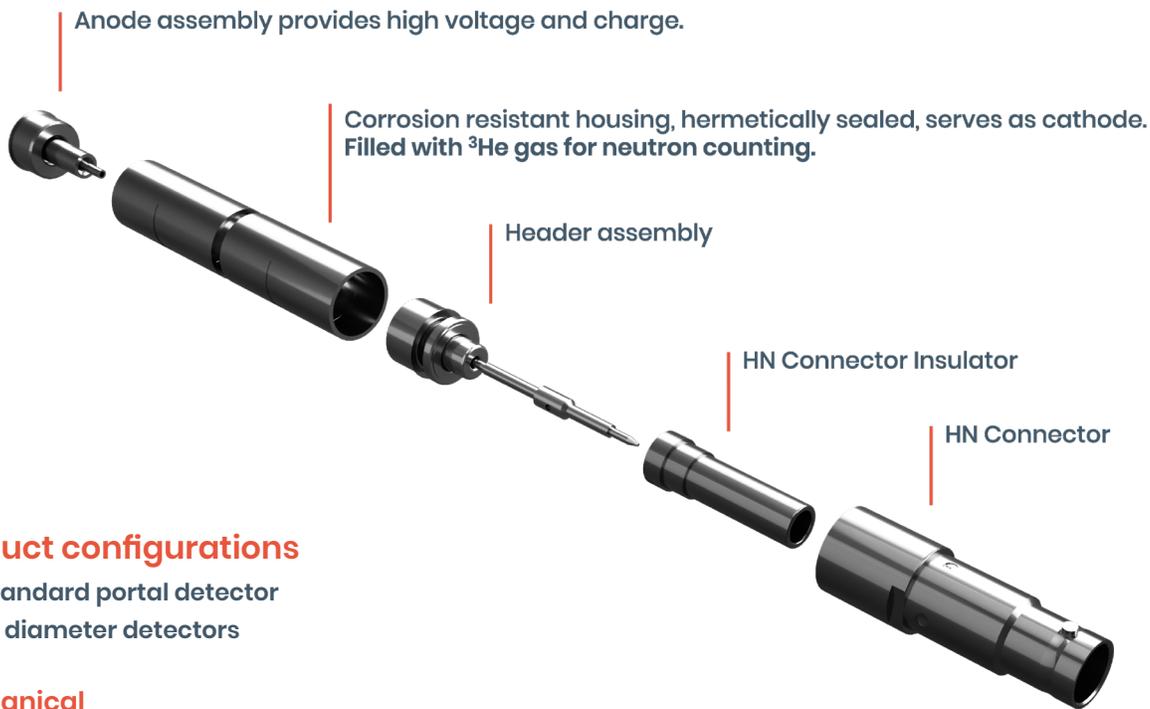
And, this series of Reuter-Stokes radiation detectors are "plug and play" for quick and straightforward installation. This pre-engineering also allows for quicker turnaround times and on-demand fulfillment so you can get instruments when you need them, on your schedule.

### Reduced false alarms

The performance of a neutron detector is measured in sensitivity, both in detecting the presence of radioactive materials, as well as in not generating false alarms.

Reuter-Stokes' design and manufacturing processes have been developed to minimize microphonics and false alarms during normal operation. With extensive experience in high vibration environments, Reuter-Stokes can design a detector to satisfy your operational requirements.





## Product configurations

- Standard portal detector
- 2" diameter detectors

## Mechanical

- **Nominal diameter:** 2 inches\*
- **Active lengths:** Up to 72 inches\*
- **Connector:** HN (MHV and SHV optional)
- **All welded and brazed construction**

## Material

- **Outer shell:** Stainless steel
  - Specially selected to provide the lowest inherent background possible)
  - Aluminum optional
- **Silver plated brass connector**
- **Insulators:**
  - Teflon connector
  - Alumina ceramic detector
- **Neutron sensitive material:**  $^3\text{He}$
- **Fill pressures:** Up to 20 atmospheres

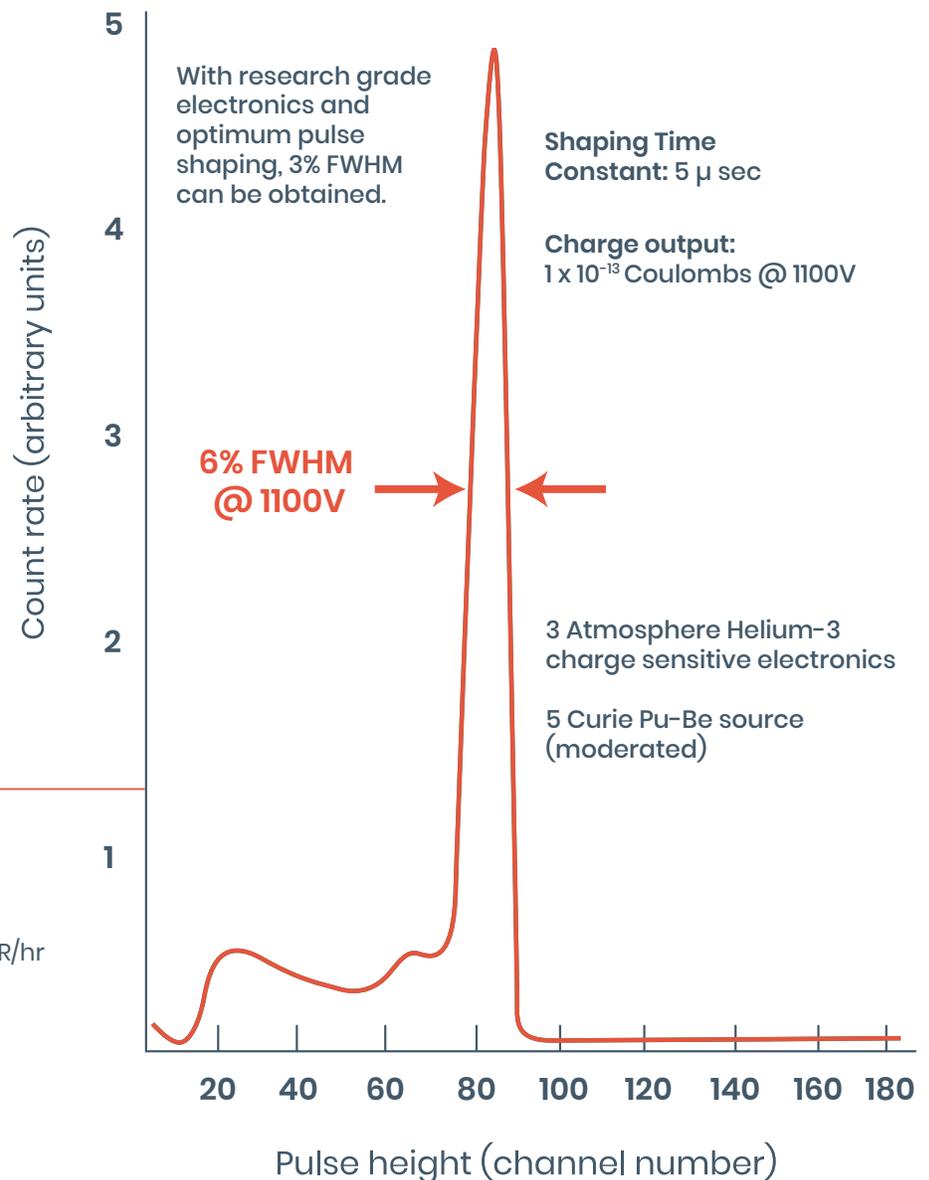
## Maximum ratings

- **Voltage:** 2500 V
- **Operating temperature:** 100°C (212°F)

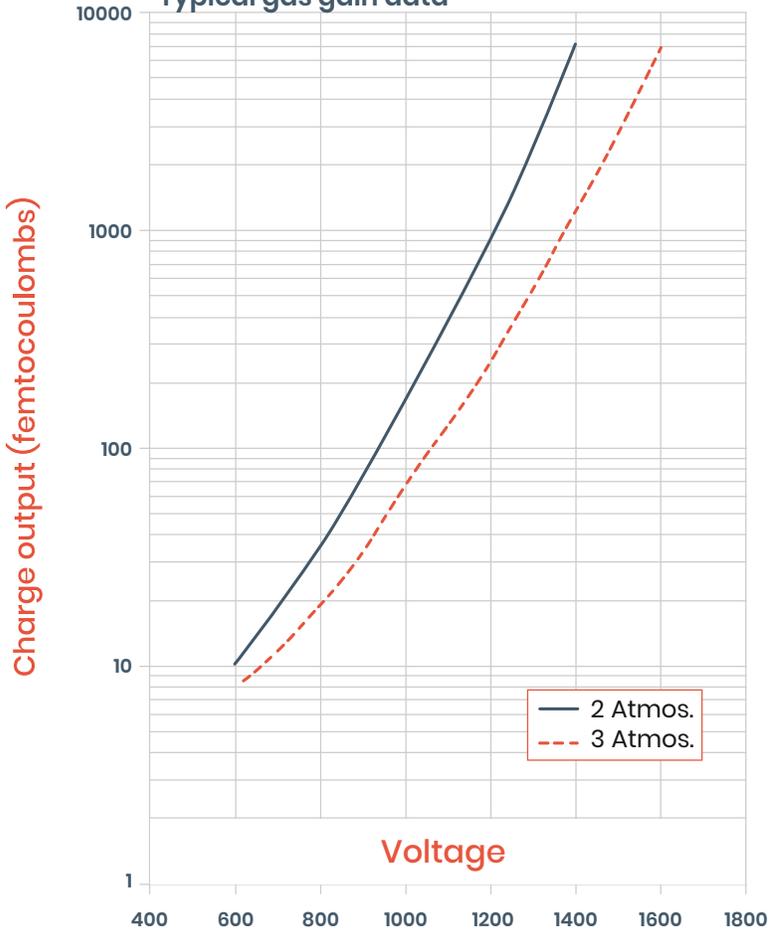
## Typical operating characteristics

- **Thermal neutron efficiency:** >60%
- **Plateau lengths:** >200 volts
- **Resolution (FWHM):** See Figure 1
- **Operating voltage characteristics are displayed on gas gain curve.**
  - Actual operating voltage will be determined by gains
- **Gamma discrimination of dose rates:** >100 mR/hr
- **Gain matching between detectors:**
  - +/- 7% typical (+/- 3% optional)

**Figure 1:**  
Typical differential pulse height spectrum

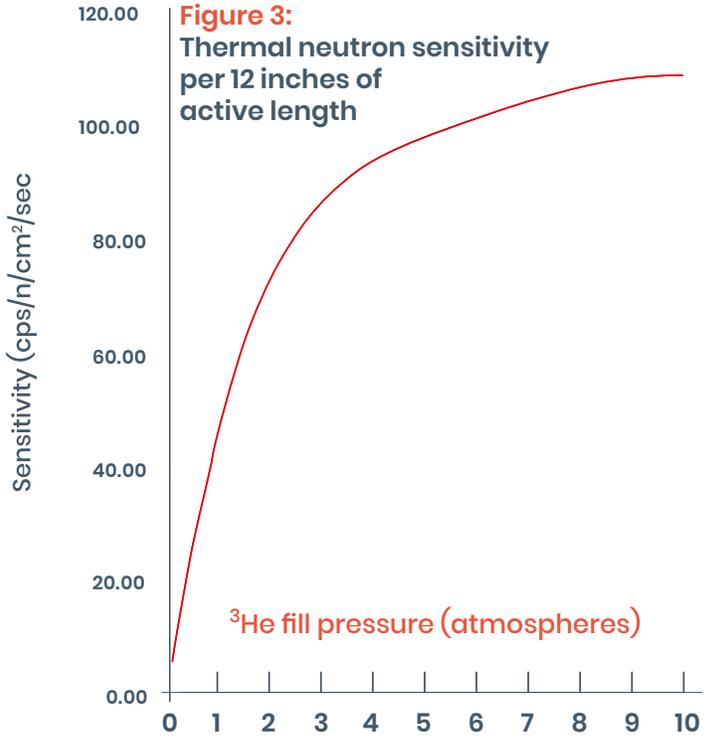


**Figure 2:**  
Typical gas gain data



Active length*	<sup>3</sup> He pressure (atm)	Sensitivity (cps/nv)
24"	2	157
	2.5	174
	3	185
	4	202
36"	2	236
	2.5	260
	3	278
	4	303
48"	2	315
	2.5	347
	3	371
	4	405
60"	2	393
	2.5	434
	3	464
	4	506
72"	2	472
	2.5	521
	3	557
	4	607

**Figure 3:**  
Thermal neutron sensitivity per 12 inches of active length





# Contact us

The Reuter-Stokes radiation detector is a rugged solution, proven to perform accurately in the installed application. With one of the longest operational lives in the industry, you can be confident in the performance of our products.

Minimize maintenance and spare parts expense, while maximizing portal uptime and availability.

Contact Reuter-Stokes today for more information on our portfolio of Helium-3 filled proportional counters for homeland security radiation portal monitors.

[reuter-stokes.com](https://reuter-stokes.com)

