



# Downhole Drilling Product Solutions

## Decades of Critical Solutions in Harsh Environments

Reuter-Stokes, a Baker Hughes business, provides downhole sensors and electronics to support your downhole operations. We provide scintillation detectors for gamma-ray and spectroscopy applications and neutron detection to confirm that you have the best data for your formation evaluation. Our uniquely rugged design ensures the largest volume scintillation crystals can be used in operations with minimal footprints while keeping sensitive equipment safe from damage in these extreme applications.

As the upstream oil and gas market continues to evolve to faster drilling and advanced measurements, Reuter-Stokes has been at the forefront of delivering customized formation evaluation and directional sensor measurements for oilfield services companies and Measurement While Drilling / Logging While Drilling (MWD/LWD) system OEMs around the globe.

### Neutron Detectors

Reuter-Stokes has been providing neutron sensors to the oil and gas industry for over 60 years. With over 67,000 neutron detectors sold to date, customers can be assured they'll get the perfect detector for their application requirements.

Features and benefits:

- Neutron Count-Rate plateau slope <4% per 100 V within the operating voltage range.
- At least 150 V common plateau between +25°C (77°F) and +200°C (392°F) with <2% count rate shift.
- Patented anode suspension minimizes shock-induced false counts.



### Directional Sensors and Orientation Modules

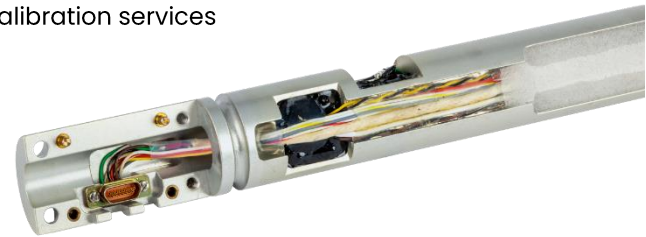
Reuter-Stokes' custom designed orientation modules provide unsurpassed measurement accuracy, reliability and calibration stability helping customers reach total depth in harsh drilling environments.

The current portfolio includes a wide range of sizes, electronics packages, and configurations. Innovative compact electronics and packaging designs result in smaller, more reliable orientation modules with borehole survey technology designed to fit into the smallest tools.

By providing accurate and stable survey measurements with minimal downhole power consumption, the orientation module minimizes the operational costs associated with downhole batteries and enables the horizontal drilling techniques required for unconventional well development.

Features and benefits:

- Operating temperature range: from  $-20^{\circ}\text{C}$  to  $175^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$  to  $347^{\circ}\text{F}$ )
- Customizable orientation modules including a wide range of sizes, electronics packages, and configurations
- State-of-the-art total field calibration lab with best-in-class calibration services



### **Gamma-Ray Scintillation Detectors**

Reuter-Stokes can provide you with a custom solution. We offer a broad range of configurations, including crystal size, mounting and interface adaptations, as well as integrated radioactive calibration sources. Crystal packages can be optimized for light output, energy resolution, and sensitivity per customer requirements.

Delivering one of the industry's highest sensitivities, Reuter-Stokes' gamma sensors provide geologists and drilling contractors with the precise measurements required for accurate formation evaluation.

Features and benefits:

- Operating temperatures: to  $175^{\circ}\text{C}$  ( $347^{\circ}\text{F}$ )
- Shock survivability to 1,000 g, 0.5 msec duration
- Random vibration rating up to 20 g RMS, 10 to 1000 Hz



# Catalog Products

While Reuter-Stokes primarily works with customers to develop custom product offerings, we also stock standard sizes to meet your immediate needs.

## Neutron Detector

Part Number	Application	Diameter (in)	Operating Voltage Range (V)	Plateau Length @175C minimum	Resolution (%)	Sensitivity (cps/nv)	Active Length (in)	Overall Length (in)	Total Pressure (PSIA)
RS-P4-0604-225	Drilling	0.75	1050-1300	4%/100V   150V Length	17	11.5	4.0	6.5	170.0
RS-P4-0606-209	Drilling	0.75	1150-1625	4%/100V   150V Length	15	18.7	6.0	8.2	178.1
RS-P4-0803-241	Wireline	1.00	1100-1400	4%/100V   150V Length	20	10.0	3.0	4.9	66.0
RS-P4-0803-264	Drilling	1.00	1250-1700	3%/100V   150V Length	25	12.4	2.7	5.9	181.3
RS-P4-0804-250	Wireline	1.00	1000-1600	3%/100V   200V Length	10	16.9	4.0	7.6	149.0
RS-P4-0806-211	Wireline	1.00	1250-1500	3%/100V   250V Length	10	22.5	5.9	9.6	90.0
RS-P4-1004-219	Wireline	1.25	1000-1700	3%/100V   150V Length	12	17.5	4.1	5.8	60.0
RS-P4-1206-219	Wireline	1.25	1050-1300	3%/100V   150V Length	16	42.0	6.0	7.6	150.0
RS-P4-1208-204	Wireline	1.50	1200-1600	3%/100V   150V Length	15	52.0	8.0	11.5	100.3
RS-P4-1406-219	Wireline	1.75	900-1250	3%/100V   150V Length	15	49.0	6.0	8.5	147.7
RS-P4-1408-205	Wireline	1.75	1100-1600	3%/100V   200V Length	15	62.1	8.0	9.9	91.5
RS-P4-1606-219	Wireline	2.00	1000-1600	3%/100V   150V Length	15	45.0	6.0	9.4	59.6
RS-P4-1808-229	Wireline	2.25	1300-1600	2%/100V   200V Length	15	90.0	8.0	10.3	150.0
RS-P4-2012-204	Wireline	2.50	1100-1700	2%/100V   200V Length	15	130.0	12.0	15.9	61.5

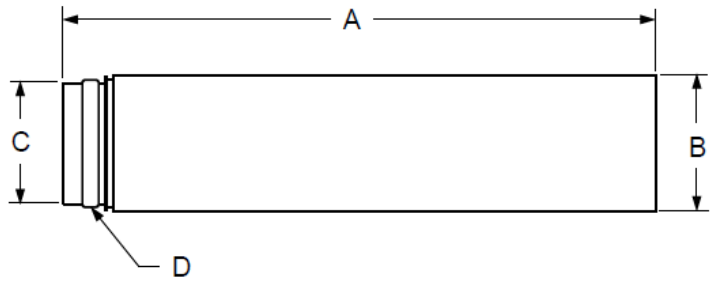
Reuter-Stokes makes no representations or warranties as to the accuracy of the information for any specific use.

## Orientation Modules

Part Number	Temperature (c)	Analog/Digital	Power Requirement (volts DC)	Operating Temperature (c)	Diameter (in)	Overall Length (in)
RS-411984	175	Analog	± 15	-25 to 175	1.36	22.70
RS-400011	150	Digital	± 15	-25 to 150	1.36	29.20
RS-411986	175	Digital	± 15	-25 to 175	1.36	29.20

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Note: All orientation modules have a vibration is 20g<sub>rms</sub>, 5-500 Hz and a shock of 1000g, 0.5ms, half-sine.



## Gamma Sensors

Part Number	Sensor Length (A)	Sensor Diameter (B)	Window Diameter (C)	Thread (D)*	Crystal Diameter	Crystal Length	PMT
RS-SI-0646-000	4.8"	1"	0.787"	15/16-32 UN-2A	0.841"	4.32"	R3991A
RS-SI-0710-000	1.453"	1"	0.787"	15/16-32 UN-2A	0.841"	0.98"	R3991A
RS-SI-0724-000	2.938"	1"	0.787"	15/16-32 UN-2A	0.841"	2.48"	R3991A
RS-SI-0740-000	4"	0.875"	0.662"	13/16-32 UN-2A	0.707"	3.387"	R3991A
RS-SI-0828-000	2.875"	1.125"	0.907"	1 1/16-28 UN-2A	0.948"	1.98"	R3991A
RS-SI-1046-000	4.8"	1.375"	1.157"	1 5/16-28 UN-2A	1.212"	4.171"	R1288A

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Note: All measurements in inches ("). All gamma sensors are qualified to the drilling specifications of vibration up to 20g<sub>rms</sub>, 30 to 1,000 Hz and shock up to a 750g, 0.5ms duration. Gamma sensors are available as crystal packages or with a PMT.

\*Thread size can be modified to larger sizes as needed.

## Summary

Reuter-Stokes' manufacturing facilities have the advanced technologies and rigorously controlled quality assurance needed to deliver precise and reliable downhole sensors. We have invested in this production capacity by adding over 1,600 square feet of dry room production space and an additional vibration table for scintillation crystal processing to our 163,000-square-foot Twinsburg plant. Reuter-Stokes' application and customization expertise ensures you will receive reliable products built for your specific purpose.

# Contact Us

Reuter-Stokes is dedicated to providing high quality, high reliability equipment to our customers. To support our products, we would be delighted to discuss your downhole drilling needs and provide any support necessary. Please [contact us](#) on our website or speak to a representative by calling +1 330 425 3755.



Scan the QR code to be taken to the contact us form.



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