OTHER ORDELA SYSTEMS

Our product line is as unlimited as your imagination. If you have a special experiment or need something different in your detector system, please call us and let us know. We will work with you to select a standard system if it will meet your needs, or work with you to design a custom system specifically tailored to your requirements.

ORDELA, Preamplifier-Per-Wire, One-Dimensional Curvi-Linear PSPCs

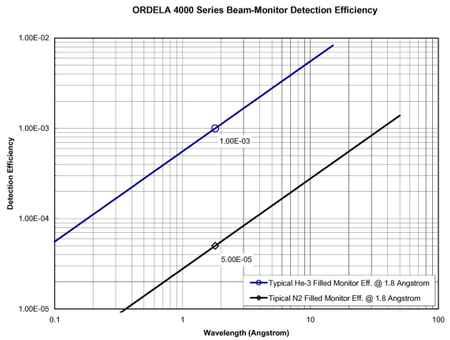
Model	Active Arc	Focal Distance	Active Depth	Detection Efficiency	Pixels	Pixel Size
1410N	124.8°	71.0 cm	3.8 cm	96% for 3Å	624	0.20° of arc
1348N	36°	36.8 cm	5.1 cm	98% for 3Å	48	0.75° of arc

Table 3 Typical One-Dimensional Curvi-Linear PSPCs with Preamplifier-Per-Wire

Model 1348N One-Dimensional Curvi-Linear PSPC with Preamplifier-Per-Wire

NEW!
BEAM MONITORS

Several of our customers have requested Beam Monitors and ORDELA has developed an extensive line of devices to meet these customer requirements. Pictured, right, is our Model 4511N.



ORDELA Series 4000N NEUTRON BEAM MONITORS

Model	Active Area	Active Depth	Overall Dimensions	Preamp	Connectors	Electronics Option
4511N	5.1 x 11.4 cm	1.3 cm	8.9 x 25.4 x 2.3 cm	QS-03	SHV & 9 pin Sub-D	4001N-Amp/SCA/HV
4511N-SHV	5.1 x 11.4 cm	1.3 cm	8.9 x 25.4 x 2.3 cm	none	SHV	
4516N	5.1 x 16.5 cm	1.3 cm	8.9 x 30.4 x 2.3 cm	QS-03	SHV & 9 pin Sub-D	4001N-Amp/SCA/HV
4516N-SHV	5.1 x 16.5 cm	1.3 cm	8.9 x 30.4 x 2.3 cm	none	SHV	
4560N	5.1 x 6.4 cm	1.3 cm	8.9 x 20.3 x 2.3 cm	QS-03	SHV & 9 pin Sub-D	4001N-Amp/SCA/HV
4560N-SHV	5.1 x 6.4 cm	1.3 cm	8.9 x 20.3 x 2.3 cm	none	SHV	
4770N	7.6 x 11.4 cm	1.3 cm	11.4 x 25.4 x 2.3 cm	QS-03	SHV & 9 pin Sub-D	4001N-Amp/SCA/HV
4770N-SHV	7.6 x 11.4 cm	1.3 cm	11.4 x 25.4 x 2.3 cm	none	SHV	

Cover photo, the Sombrero Galaxy, courtesy of NASA and the Hubble Telescope.

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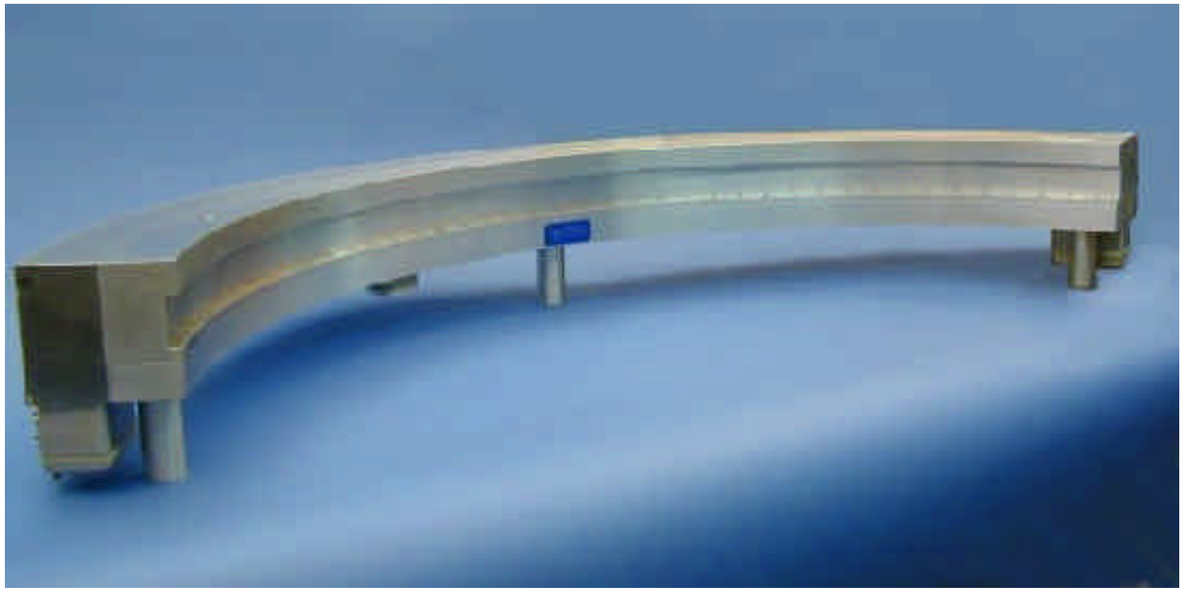
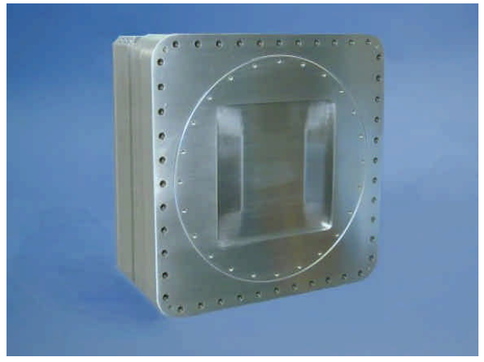
ORDELA INC.
OAK RIDGE DETECTOR LABORATORY





Position Sensitive Neutron Detectors

Discover New Worlds of Materials Analysis with detectors from ORDELA, Inc.

NEUTRON SCATTERING AND DIFFRACTION RESEARCH

Neutrons are ideal probes for determining structures of condensed matter matrices. Since they have a neutral charge, and are affected by internal magnetic fields, they may be used to determine magnetic states in matter. Often both the matter's magnetic and nuclear structures may be explored simultaneously. Neutrons may be produced by moderated nuclear reactors or spallation sources. The neutron wavelength may be controlled such that it is comparable with the atomic spacing of the solid or liquid sample matrix. In this way, the neutrons interact with the atoms of the matrix in predictable, measurable ways, scattering and diffraction being two of these interactions.

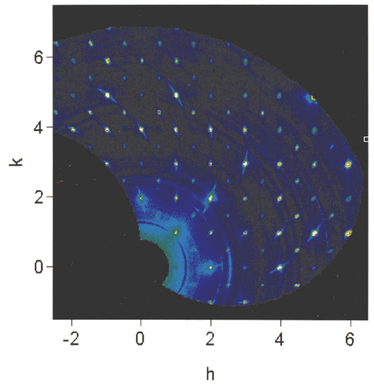
Neutrons, unlike x-rays, are used to probe the nucleus of matrices. X-rays interact with the material's electron cloud while the massive neutrons are able to penetrate and probe to the heart of the matter, into the bulk material. In addition, at very small Bragg angles, neutrons may be used to analyze surface structures and characteristics. Neutrons may also be used to research dynamic processes within matter.

Whatever your use or application, ORDELA, Inc. has a detector to meet your needs. Or, we can custom-design the best detector to meet your unique needs. Just ask.

INNOVATIVE DESIGN FEATURES

The following innovative design features are common to ORDELA, Inc. position sensitive proportional counters and make your measurements easier and more reliable.

- Multi-anode/multi-cathode and preamplifier per cathode for both excellent angular resolution and count rate capability
- Extended anode life, often greater than an order of magnitude, over traditional RC-encoded systems
- Pulse height analysis from anode wire plane preamplifier
- Designed to operate inside the vacuum flight path
- All metal and ceramic vacuum feedthroughs and components for maintaining both a clean vacuum and interior counting gas reliability
- Electronics isolated from vacuum and operate at atmospheric pressure for reliability and serviceability
- Multiple Event Discrimination (MED) between adjacent wires eliminates spurious noise
- 6061-T6 Aluminum construction for stability and long life



Neutron Image obtained from Model 1410N

ORDELA, Preamplifier-Per-Wire, Two-Dimensional PSPCs

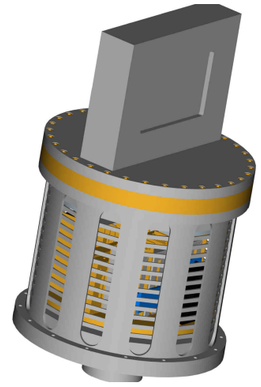
Model	Active Area X-axis	Active Area Y-axis	Active Depth (cm)	Detection Efficiency	Pixels X-axis	Pixels Y-axis	Pixel Size X-axis
21000N	98.0 cm	98.0 cm	6.4	80% for 5Å	192	192	5.1 mm
2660N	64.5 cm	64.5 cm	2.5	84% for 5Å	128	128	5.1 mm
2661N	64.5 cm	64.5 cm	4.5	76% for 5Å	128	128	5.1 mm
2410N	40.6 cm	40.6 cm	2.5	91% for 5Å	128	128	3.2 mm
2321N	32.0 cm	32.0 cm	2.5	85% for 5Å	64	64	5.1 mm
2320N	32.0 cm	32.0 cm	2.5	85% for 5Å	32	32	10.1 mm

Table 1 Typical, Two-Dimensional, Position-Sensitive Proportional Counters with Preamplifier-Per-Wire

A CLOSER LOOK AT ORDELA DETECTOR SYSTEMS

DESCRIPTION

Position-sensitive proportional counters (PSPCs) and position-encoding electronics are designed and manufactured by ORDELA, Inc. in many standard (and custom) designs for applications in neutron scattering and diffraction research. Multi-anode/ multi-cathode and preamplifier-per-cathode design results in excellent angular resolution and count-rate capability. The counting volume and active area of our Two Dimensional Preamplifier Per Wire Proportional Counters are depicted in Table 1 and our One Dimensional Preamplifier Per Wire Proportional Counters in Table 2. The counting gas is ^{3}He-CF_4 for high neutron detection efficiency and reduced gamma-radiation cross-section. Our PSPCs operates at low gas multiplication; that is, the anode avalanche typically generates 160 femtoCoulombs of charge per detected neutron. This is approximately 5% of the charge required for operating the original Model 2650/2651N. This reduction in charge requirement by itself should increase the life time of the anode by a factor of twenty compared to the original Model 2650N/2651N.



Model 1128N
One Dimensional PSPC
Detector and Electronics
Package

The PSPC pressure vessel and electronics enclosure are constructed of Aluminum 6061-T6. They are designed for operation inside a vacuum flight path. Their design pressure is three times their operational pressure in vacuum, and they are tested to 50% over-pressure for increased operational and shipping safety. Only metal and ceramic components are used inside the counting volume for improved gas purity over extended time periods.

Typical position-encoding electronics consists of one low-noise, wideband preamplifier/discriminator per cathode wire for independent amplification and discrimination of each of the outputs. All cathode wire signals are grouped into sets of modular preamplifier card, discriminator card, and front-end-processing card. Multiple Event Discrimination (MED) between adjacent wires is implemented with Programmable Gate Array (PGA) circuits by oversampling discriminator outputs of each wire. This technique also eliminates spurious noise pulses from being processed. All cathode outputs are connected to the onboard processor for coincidence analysis between the x- and y- coordinates. The data output flow is controlled via the Fast Digital Interface (FDI) to latch valid X-Y coincident events. A handshake signal with the host computer or data logger will update the one-event latch with a new event. Coincident X-Y events from the detector cathode wires can be processed and latched on the FDI for readout at a sustained cycle time of up to 100 ns. Standard features include an anode preamplifier to process outputs from the anode wire plane for pulse-height analysis. An onboard processor allows for remote control of the discriminator settings for each wire and the high voltage power supply setting via an RS-485 differential serial bus. Software is provided so the user can easily control these functions from the data acquisition PC. The position-encoding electronics are modular for simple maintenance and replacement. A minimum number of processing devices are used to maximize encoding speed and reliability of the detector.

All the PSPC position-encoding electronics are contained in a sealed enclosure located on the PSPC back plane. This enclosure is vented to atmosphere to allow operation of the electronics at atmospheric pressure when the PSPC is located in a vacuum flight path. The enclosure is easily accessible for maintenance.

ORDELA, Preamplifier-Per-Wire, One-Dimensional PSPCs

Model	Active Length	Active Height	Active Depth	Detection Efficiency	Pixels	Pixel Size
1128N	12.8 cm	8 cm	2.5 cm	96% for 3Å	128	1 mm

Table 2 Typical One-Dimensional PSPC with Preamplifier-Per-Wire Specifications