Neutron Detection Solutions

NeuTruck™ and NeuPort™ are a family of novel neutron detection solutions developed to detect neutron without He-3. These are fully integrated neutron detection solution designed to be a plug and play replacement of He-3 tubes.

Plug & Play

Replaces He-3 systems without modification of existing electronics or significant changes in voltage.

Fully Integrated

Incorporates the electronics that allows calibration to meet specifications.

Reliable

Is based upon well established technologies that guarantee product reliability over time.

Safe

Contains no hazardous materials and does not require secondary containment.

Value

Provides performance that meets or exceeds ANSI standards at a market-leading price point due to its underlying technology and optimized design.

Product Technology -

NeuTruck™ and NeuPort™ systems are a LiF/ZnS(Ag) based neutron detector incorporating a design concept reported in LANL references* and successfully applied in multiplicity counters.

The entire assembly is contained within a high density polyethylene moderator box and complies to ANSI 42-35 standards requirements.

*Ref:
LA-UR-00-3004 (2000)
LA-UR-01-3848 (2001)
Neutron Detection Solution

Typical Design and Performance –
The technology is scalable.
A designs can be adjusted to meet specification requirements and size available in the enclosure.

Typical product performing in a 10mR/hr $^{60}$Co field –

<table>
<thead>
<tr>
<th>Application</th>
<th>Overall Dimensions</th>
<th>Neutron Efficiency *(cps/ng)</th>
<th>Gamma Rejection</th>
<th>Part Number</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NeuTruck</strong> Mobile</td>
<td>85” x 12.5” x 4.2”</td>
<td>$\geq$ 2.5</td>
<td>$\leq 1 \times 10^{-6}$</td>
<td>200-8065</td>
<td>Nu85X12.5X4.2-2.5</td>
</tr>
<tr>
<td></td>
<td>85” x 12.5” x 4.2”</td>
<td>$\geq$ 2.8</td>
<td>$\leq 1 \times 10^{-6}$</td>
<td>200-8048</td>
<td>Nu85X12.5X4.2-2.8</td>
</tr>
<tr>
<td><strong>NeuPort</strong> Portal</td>
<td>34” x 14” x 4.2”</td>
<td>$\geq$ 1.6</td>
<td>$\leq 1 \times 10^{-6}$</td>
<td>200-8108</td>
<td>Nu34X14X4.2-1.6</td>
</tr>
<tr>
<td></td>
<td>34” x 14” x 4.2”</td>
<td>$\geq$ 2.0</td>
<td>$\leq 1 \times 10^{-6}$</td>
<td>200-8009</td>
<td>Nu34X14X4.2-2.0</td>
</tr>
</tbody>
</table>

*Measured with $^{252}$Cf moderated source @ 2 meters from the center

Other operating conditions can be considered upon request

Electrical Specifications (22°C):

- VDC 5V
- Current 0.8A
- Power 4W
- Signal output: TTL (Transistor Transistor Logic) compatible
- Cable Length: 5 feet
- TTL Pulse every Neutron detected
- TTL Pulse output impedance: 50 ohms
- Connectors: Power Supply: Pigtail
  TTL Out: Male BNC

Custom output and connectors are available

- Operating temperature: -30°C to +55°C

System includes –

- Flat packaged neutron sensitive detectors
- Full electronics with pulse shape discrimination (PSD) algorithms
- Proprietary Pulse Shape Discrimination (PSD) algorithm is employed to count neutrons and reject gamma ray events. (Figure 1)
- Gain stabilization
- High density polyethylene moderator enclosure
- Cables and connectors (customizable)

![Figure 1. Pulse Shape Discrimination](image-url)

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