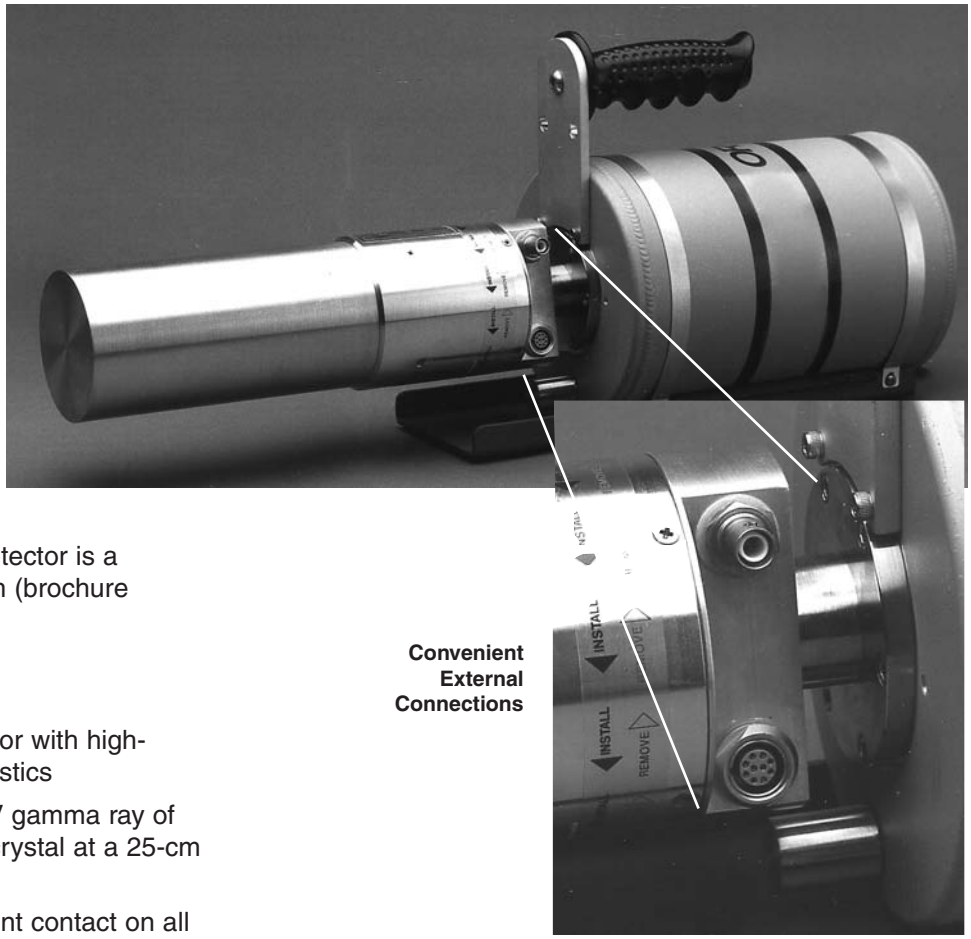
ORTEC®

PINS-GMX

Portable Isotopic Neutron-Spectroscopy GAMMA-X Detector

The **P**ortable **I**sotopic **N**eutron-**S**pectroscopy GAMMA-X (PINS-GMX) detector was created from a joint development of ORTEC and the Idaho National Engineering Laboratory* (INEEL) in response to the growing worldwide need to determine *in situ* the specific nature of the contents of a variety of containers of munitions or potential chemical weapons. Such applications require a detector with high resolution over a large range of energy, portability, neutron damage resistance, reliability, and ease of use. The performance of the PINS-GMX detector has been verified in real-world use by the U.S. Army. The detector is a component of the ORTEC PINS System (brochure available on request).



Convenient External Connections

Features

- High purity germanium (HPGe) detector with high-neutron damage resistance characteristics
- Relative efficiency >40% for 1.33-MeV gamma ray of ^{60}Co, relative to a 3-in. x 3-in. NaI(Tl) crystal at a 25-cm source-to-detector distance
- Rugged 0.3-microns thick boron implant contact on all outer surfaces
- Rugged all aluminum endcap with front window thickness of ≤1 mm
- Detector crystal to endcap front distance ≤5 mm
- Horizontal concentric type preamplifier
- Preamplifier outputs capable of driving 150 feet of coaxial cable without measurable degradation to the pulse shape or resolution
- Single connector with LEMO-type connection for test input, energy output, and preamplifier power at the detector
- SHV-type high-voltage connector at the detector
- 10-meter single cable (M-1-C10) MCA connection (other cable lengths available)
- Hermetically sealed high voltage coupling
- Minimum operating bias of –3000 volts, and typically operates at bias between –4000 and –5000 volts
- All attitude portable style cryostat and dewar providing adequate cooling in any orientation if any liquid nitrogen is in the dewar
- Dewar capacity of 1.2 liters liquid nitrogen, with nominal 20-hour holding time
- High-rate indicator for excessive count rate
- Internal temperature sensor providing necessary signal for high-voltage shutdown in the event of accidental warm up
- A sensor is incorporated into the cryostat in such a way that if the detector warms up, a logic signal to gate off the high-voltage power supply will be generated
- Can be safely thermal cycled to room temperature

*CRADA 93-ST-12

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Specifications

- Resolution:
  - FWHM: ≤1.95 keV at 1.33 MeV
  - FWTM: ≤3.90 keV at 1.33 MeV
  - FWFM: ≤5.85 keV at 1.33 MeV
  - Peak-to Compton (pC) ratio: >55:1
  - FWHM: ≤825 eV at 88 keV
  - FWHM ≤750 eV at 22 keV
  - Peak area ratio from ^{109}Cd at 22-keV to 88-keV >7
  - Ratio of 2.6-MeV to 1.33-MeV FWHM resolutions <1.5
- The FWHM of a time spectrum taken with the detector and an 1-in. x 1-in. plastic scintillator with an energy window 100 keV wide and constant-fraction timing:

Energy Window Centroid (keV)	FWHM (Nanoseconds)
150	≤15.0
250	≤12.0
350	≤8.5
511	≤6.5
1170	≤3.0

- Capable of operating at energy rates >50,000 MeV/sec without preamplifier lockup and without deterioration in resolution beyond that contributed by the main amplifier

Ordering Information:

Model Number	Description
PINS-GMX	GAMMA-X Detector for PINS-2 System. Includes CFG-MG4-1.2 Dewar/Cryostat and single 10-ft. DigiDART-to-detector connection cable. Other configurations available on request.
PINS-OPT1	Special 82 ft. single DigiDART-to-detector connection option
Options	
B/PFA-1.2L	Bayonet Pressure Fill
DWR-S/F	Storage Fill Dewar
SMART-1-N	SMART-1 detector option for negative bias detector. To order, add SMART-1-N as a separate line item.

Specifications subject to change
110507

ORTEC®
www.ortec-online.com
Tel. (865) 482-4411 • Fax (865) 483-0396 • info@ortec-online.com
801 South Illinois Ave., Oak Ridge, TN 37831-0895 U.S.A.
For International Office Locations, Visit Our Website