

LIQUID NITROGEN COOLED DETECTORS FOR HIGH RESOLUTION GAMMA SPECTROSCOPY

P-type HPGe Coaxial Detectors

MAIN FEATURES

- 10% – 160% efficiency HPGe p-type coaxial detectors are available
- Energy range from 40 keV to 10 MeV for GCD model
- Energy range from 3 keV to 10 MeV for GCDX model
- Input window materials: Aluminium, Beryllium or Carbon-fiber
- Built-in or Remote Preamplifier types are available depending on application
- High efficiency of radiation detection
- High energy rate up to 200000 MeV/sec
- Excellent peak symmetry and high resolution
- Detection of radiation in any spatial orientation depending on cryostat modification
- Manufacture in a portable cryostat is possible
- High count rate indicator
- HV supply protection if detector is warm
- Low instrument background and Ultra – low background materials are available

DESCRIPTION

Germanium detectors are semiconductor diodes having a p-i-n structure in which the intrinsic (I) region is sensitive to ionizing radiation, particularly X rays and gamma rays. When photons interact with the material within the depleted volume of a detector, charge carriers (holes and electrons) are produced and are swept by the electric field to the P and N electrodes. This charge, which is in proportion to the energy deposited in the detector by the incoming photon, is converted into a voltage pulse by an integral charge sensitive preamplifier.



Because germanium has relatively low band gap, these detectors must be cooled with Liquid nitrogen (temperature of 77 °K).

P-type HPGe Coaxial Detector is also intended for Detection of Gamma rays in nuclear energetics and environmental control, in industry and scientific research, in medicine and other applications.

The **P-type HPGe Coaxial Detector** complete set is composed by the following components:

- HPGe coaxial detector
- Preamplifier with cooled input stage
- Dewar vessel
- Cable set
- Documentation

ACCESSORIES

In addition to standard supply, the following accessories are available upon request:

- Hexagon Multichannel Analyzer
- Analytical Software packages:
 - quantitative and qualitative analysis
 - Gamma spectra modeling and efficiency registration calculation for complex geometry objects
 - extended radionuclide library
- Liquid nitrogen storage and filling system
- Liquid nitrogen sensor and monitor
- Cable set extension

Model	Efficiency (%)	Energy resolution at 122 keV (eV)	Energy resolution at 1.33 MeV (keV)	Peak / Compton ratio	Peak Shape FW.1M / FWHM	Peak Shape FW.02M / FWHM
GCD-10175	10	825	1.75	41:1	1.90	2.65
GCD-15180	15	825	1.80	46:1	1.90	2.65
GCD-20180	20	850	1.80	51:1	1.90	2.65
GCD-25185	25	850	1.85	55:1	1.90	2.65
GCD-30185	30	875	1.85	58:1	1.90	2.65
GCD-35190	35	875	1.90	60:1	1.90	2.65
GCD-40190	40	895	1.90	62:1	1.90	2.65
GCD-50190	50	895	1.90	64:1	1.90	2.65
GCD-60200	60	1000	2.00	68:1	2.00	3.00
GCD-70200	70	1000	2.00	73:1	2.00	3.00
GCD-80210	80	1000	2.10	77:1	2.00	3.00
GCD-100220	100	1000	2.10	81:1	2.00	3.00
GCD-120220	120	1000	2.10	83:1	2.00	3.00
GCD-140220	140	1100	2.20	86:1	2.00	3.00
GCD-160230	160*	1150	2.20	88:1	2.00	3.00

Model	Efficiency (%)	Energy resolution FWHM at 5.9 keV (eV)	Energy resolution FWHM at 122 keV (eV)	Energy resolution FWHM at 1.33 MeV (keV)	Peak / Compton ratio	Peak Shape FW.1M / FWHM	Peak Shape FW.02M / FWHM
GCDX – 10 175	10	400	720	1.75	41:1	1.90	2.65
GCDX – 15 180	15	450	740	1.80	46:1	1.90	2.65
GCDX – 20 180	20	460	760	1.80	51:1	1.90	2.65
GCDX – 25 185	25	480	775	1.85	55:1	1.90	2.65
GCDX – 30 185	30	500	800	1.85	58:1	1.90	2.65
GCDX – 35 190	35	550	830	1.90	60:1	1.90	2.65
GCDX – 40 190	40	600	850	1.90	62:1	1.90	2.65
GCDX – 50 190	50	620	875	1.90	64:1	1.90	2.65
GCDX – 60 200	60	670	900	2.00	68:1	2.00	3.00
GCDX – 70 200	70	700	950	2.00	73:1	2.00	3.00
GCDX – 80 210	80	750	950	2.10	77:1	2.00	3.00
GCDX – 100 210	100*	800	1000	2.10	81:1	2.00	3.00

* Detectors with higher efficiency are available

Plenty of cryostat geometries are available



Systems and Spectroscopy Solutions

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