

TECHNICAL DATA SHEET

12 SEGMENT ENCAPSULATED GERMANIUM DETECTORS FOR CLUSTER

For each measurement, the source will be placed 25 cm from the front face of the crystal. The total count rate will be $\leq 10^3 \text{ S}^{-1}$. The number of counts in the photopeaks will be $\geq 10^5$.

SIZE OF THE DETECTOR :

- The N-type hyperpur Germanium will have initial nominal dimensions of 70 mm (diameter) and 78 mm (length) and will be tapered into an hexagonal shape.
- The relative efficiency @ 1.33 MeV after shaping will be $\geq 55 \%$

FABRICATION :

- The outer contact of the Germanium diode will be ion implanted, segmented radially in six sectors, and longitudinally in two parts of respectively 30 mm in the front and 48mm with rear.

ENERGY RESOLUTION :

- The full volume energy resolution of the detector, measured for 1.33 MeV gamma rays from a ^{60}Co source, will be $\leq 2,3 \text{ keV}$ (full width at half maximum FWHM). For 122 keV gamma rays from a ^{57}Co source, the resolution will be $\leq 1,2 \text{ keV}$ FWHM. These resolutions will be measured with main spectroscopy amplifier time constant of $\geq 6 \mu\text{s}$.
- The segment resolution (with room temperature preamplifier) from a ^{60}Co source will be $\leq 3 \text{ keV}$, mean value on the twelve segments.

PEAK TO COMPTON :

- The measured Peak to Compton for 1.33 MeV gamma rays (measured in the standard way) will have a minimum value of 60 :1.

MECHANICAL :

- The cap of the detector is hexagonally shaped in the front (61,35 mm flat to flat), cylindrical in the rear (nominal diameter 75 mm before welding), tapered at an angle of 4,125°.
- Mechanical dimensions according drawing **10PC1 72126-D** : these dimensions are subject to modifications and are only valid for the attached offer.
- The detector will be encapsulated into an hexagonal aluminium cap.
- The aluminium cap wall thickness is 0,7 mm.

ELECTRICAL :

- Cooled preamplifiers for both full volume and segments can be delivered on request :
 - The full volume preamplifier would be with resistive feed back and A.C. coupling.
 - The segment preamplifier would be with resistive feed back and D.C. coupling.
- If the detector is equipped with cooled segment preamplifiers PSC 823 or equivalent, the segment resolution should be at 2,15 keV FWHM for the 1,33 MeV line on each segment, mean value on the 12 segments.

OPTION :

- As an option, CANBERRA EURISYS SA can deliver :
 1. A set of installation in a cryostat consisting of :
 - The internal cooled full volume preamplifier front end
 - The 12 position cooled preamplifier boards
 - The set of 7 feedthroughs
 - The 13 external preamplifier boards
 - The HV filter
 2. Cryostat for one single detector, or a triplet of 3 detectors.

**For your technical inquiries, please contact your local Agent or Canberra Eurisys SA
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