CANBERRA

GM Pancake Detectors

Features

- 1.8 to 2.2 mg/cm^2 Ultra Thin Mica Window
- 28 or 45 mm effective diameter
- High alpha, beta and gamma efficiency
- Cost effective, easy to use and very reliable with unmatched quality/cost ratio

- **Our Warranty:** CANBERRA warrants that its Geiger Mueller detectors will be free from defects in materials and workmanship for a period of one (1) year from the date of initial shipment.

Description

Pancake detectors are widely used in nuclear probes and instruments for detecting and measuring alpha, beta or gamma surface contamination of clothes, small objects, benches, floors, roads, etc. Such halogen-quenched Geiger Mueller detectors are cost-effective, have an unmatched quality/cost ratio, are easy to use and are very reliable. Their ultra-thin mica window allows for an efficient detection of alpha, low energy beta and gamma radiation.

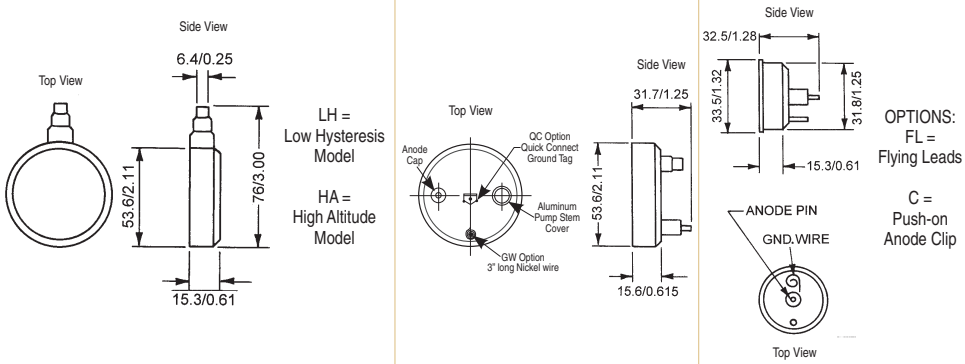
Adherence to stringent design parameters, manufacturing procedures and quality assurance provisions of CANBERRA products has successfully fulfilled commercial and military exacting standards. Our military approved detectors used by military customers worldwide, are able to withstand rigorous shock and vibration testing.

Our 2000-series of GM detectors provides a direct-replacement to most widely used competitive detectors. These can be incorporated into various radiation monitors and dosimeters. Our GM pancake detectors range in diameter from 33.5 mm (1.32 in.) to 53.6 mm (2.11 in.) and are also offered in Low Hysteresis and High Altitude models. These are used in CANBERRA's own line of products as well as products from various companies. Please contact us should you wish to discuss specific requirements or references.

GM Pancake Detectors

Pancake Detectors (Halogen Quenched)

For α, β, γ Applications



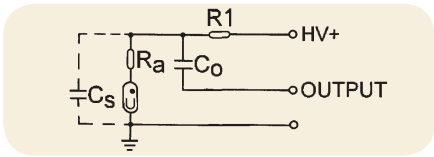
Detector Type → Characteristics ↓	T2000/8767** T2000/900 LH T2000/900 HA	T2000/500 T2000/500 LH T2000/500 HA	T2006/900 T2006 /900 LH	T2006/500 T2006 /500 LH	T2011/900	T2011/500
Application	α, β, γ	α, β, γ	α, β, γ	α, β, γ	α, β, γ	α, β, γ
Sensitivity* ^{137}Cs cpm at 1 mR/h*	3500	3500	3500	3500	1500	1500
Window Area Density (mg/cm^2)	1.8– 2.0	1.8– 2.0	1.8– 2.2	1.8– 2.2	1.8–2.0	1.8–2.0
Window Effective Diameter (mm, in.)	44.5, 1.75	44.5, 1.75	44.5, 1.75	44.5, 1.75	28.4, 1.12	28.4, 1.12
Recommended Operating Voltage (HV+)	900	500	900	500	900	500
Plateau Length Volts min.	850–1000	450–600	850-1000	450–600	850–1000	450–600
Plateau Slope (%100 V max.)	10	10	10	10	5	5
Dead Time (μs max.)	50	50	50	50	40	40
Background (cpm) Shielding 2" Pb + 1/8" Al	30 max.	30 max.	30 max.	30 max.	18 max.	18 max.
Resistor R_a (MΩ)	3.3	3.3	3.3	3.3	3.3	3.3
Resistor R1 (MΩ)	1.0	1.0	1.0	1.0	1.0	1.0
Operating Temp. (°C)	–20 to +55	–20 to +55	–20 to +55	–20 to +55	–20 to +55	–20 to +55
Cathode Material	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe
Max. Overall Length including Pins (mm, in.)	See above drawing					
Max. Overall Diameter (mm, in.)						
Window Recess (mm, in.)	1.6, 0.062	1.6, 0.062	1.6, 0.062	1.6, 0.062	1.3, 0.05	1.3, 0.05

*At recommended operating voltage.
**The only Mil. Spec. Pancake is the "jan 8767".

GM Pancake Detectors

Test Circuits

Use HV+, R_a and R1 from the chart.

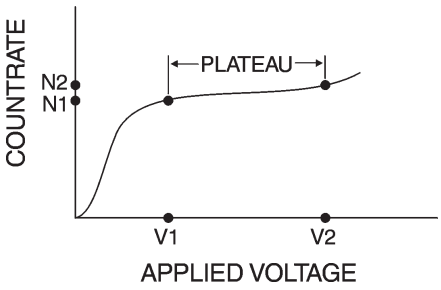


Cs = Stray capacitance typically < 1 pF.
Co = High voltage blocking capacitor.

Test Circuit – Anode Output

Plateau Calculations

Plateau slope calculations for CANBERRA data sheets are based upon IEC recommended formulae, as prescribed in the ISO affiliated publication #151-25 part 25, “Methods of measurement of Geiger Mueller counter detectors”.



$$\frac{N2-N1}{1/2(N1+N2)} \times \frac{100}{V1-V2} = \%\ \text{per volt}$$

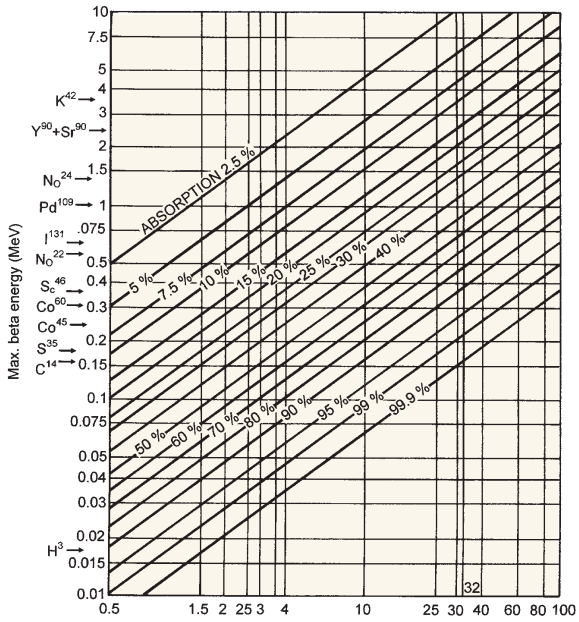
Alpha Particle Detection

The table below shows the initial energy required to penetrate a given mica window thickness. This assumes a negligible air gap between the source and the window. Note the range of alpha particles of various energies in air at atmospheric pressure.

Mica Window	α Energy	α Range in Air
1.0 mg/cm²	1.9 MeV	10 mm
2.0 mg/cm²	2.6 MeV	15 mm
3.0 mg/cm²	3.6 MeV	22 mm
4.0 mg/cm²	4.5 MeV	29 mm

Beta Particle Detection

The chart below shows the effects of mica window thickness (mg/cm²) on beta particle absorption percentage.



GM Pancake Detectors

	CANBERRA	LND	Saint Gobain
Pancake	T2000/8767	7311	N1002/8767
	T2006/900	73118	N1006
	T2011/500	7231	N1004

APPLICATIONS

Detector Type	Applications
T2000/8767 T2000/900LH T2000/900HA	SBM-2D, SBS
T2000/500 T2000/500LH T2000/500HA	BP-100
T2006/500	BP-77
T2006/500LH	MCB2, SABG-15

Specifications

ORDERING INFORMATION

- 45177 – T2000/8767.
- 45177-900LH – T2000/900LH.
- 45177-900HA – T2000/900HA.
- 45177-500 – T2000/500.
- 45177-500LH – T2000/500LH.
- 45177-500HA – T2000/500HA.
- 45452 – T2006/900.
- 45452-900LH – T2006/900LH.
- 45452-500 – T2006/500.
- 45452-500LH – T2006/500LH.
- 46300 – T2011/900.
- 46300-500 – T2011/500.

Note:

- LH: Low Hystereses model.
- HA: High Altitude model.

OPTIONS

- Anode Connector – Teflon with solder tag – Code C.
- Anode Connector – Low Profile solder tag – Code C/LP.
- Ground Wire – Code G/W.
- Anode 1 mm pin adapter – Code AP.
- Flying leads – Code FL.
- Low Hysteresis – Code LH.
- Thicker Mica Windows also available upon request.
- T2006, Quick Connect 1/4” spade ground tab option – Code QC.

ISO 9001 SYSTEM CERTIFIED