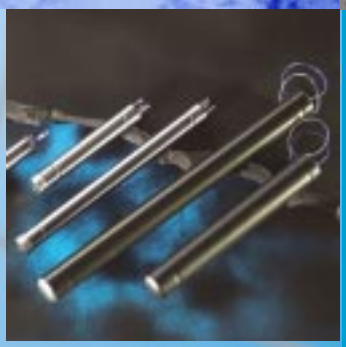
Scintillation Products



Gas-filled Radiation Detectors: Geiger-Mueller Tubes & Probes

SAINT-GOBAIN

CRYSTALS & DETECTORS

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About Saint-Gobain Crystals and Detectors

Saint-Gobain Facts –

- Established in 1665.
- The first major project was the production of the mirrors for the famous Hall of Mirrors in Versailles Palace.
- Today the Saint-Gobain group is listed among the 100 largest industrial groups worldwide.
- Produces 30 billion glass bottles each year.
- Supplies half of Europe's cars with glass.

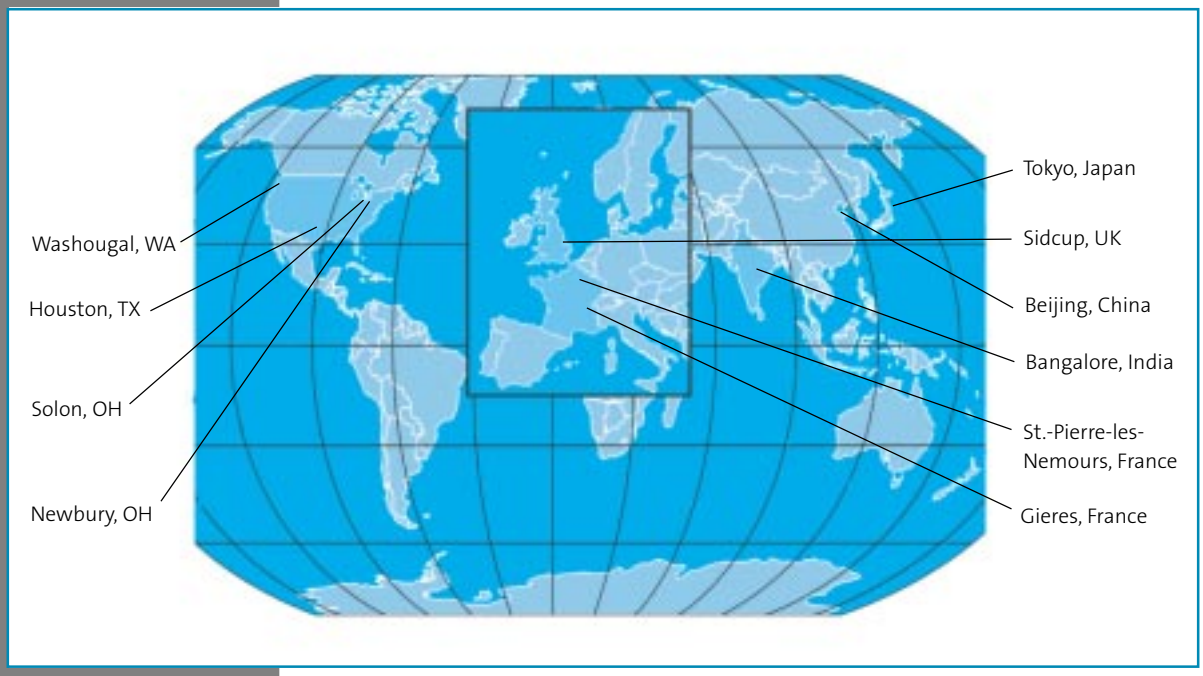
Saint-Gobain is a global leader in the manufacture and development of engineered materials such as glass, insulation, reinforcements, containers, building materials, ceramics and plastics. The formation of the Crystals and Detectors Division reinforces Saint-Gobain's commitment to the development of radiation detection and measurement products. The Division employs over 600 people at plants and sales offices throughout the world.

The Scintillation Products business of the Division is a combination of companies that have been prominent in crystal growth or in radiation detection and measurement. Notable names include: Bicron, Crismatec and NE Technology (inorganic and organic scintillators and detectors); Gamma Laboratories and TGM Detectors (gas-filled radiation detectors).

Being a part of Saint-Gobain brings us the long-term industrial strategy and investment benefits of such a dynamic group. There is a coherence centered on materials, applied to increasingly diversified needs. Saint-Gobain encourages research and development and the expansion of relevant technologies and their applications.

The Scintillation Products group manufactures quality gas-filled radiation detectors. This catalog is devoted entirely to Geiger-Mueller tubes. Please request our Specialty Products Catalog for information on our Helium-3 and X-ray Proportional Counters.

This catalog not only lists the current range of SGCD Geiger-Mueller tubes and probes, but it also goes further to explain the electro-physical characteristics that distinguish SGCD products from other manufacturers. We excel in the production of high-temperature, high-shock and vibration radiation detectors. Our staff will make every effort to accommodate your particular needs from "off-the-shelf" products to custom designed detectors.



Applications –

Geiger-Mueller tubes provide effective means for both detecting and measuring the following types of radiation: Alpha particles, Beta particles, X-rays and Gamma rays.

Typical applications for Geiger-Mueller tubes include the following:

Personnel Safety
- Body Frisking
- Survey Instruments
- Area Monitors

Recording Exposure Levels
- Digital Pocket Dosimeters
- Area Monitors
- Survey Instruments

Contamination Monitoring
- Area Monitors
- Environmental Monitors
- Stack Monitors

Non-destructive Density & Thickness Gauging
- Highway asphalt and concrete aggregate measurements
- On-line density or thickness monitoring in manufacturing

Gamma & Neutron-Gamma Oil Well Logging

Scientific Research

General Information Geiger-Mueller Tubes

Geiger-Mueller tubes have been commercially available for over 40 years. The design of a Geiger-Mueller tube is often optimized for a specific application; therefore, considerable differences in shape, size, gas formulations and radiation sensitivity exist. Our corporate objective is to take a proven technology forward to meet the needs of tomorrow's standards. Because today's Geiger-Mueller tubes need only simple electronics, are relatively rugged, and have low cost, they continue to be one of the most popular radiation detectors in use today.

G-M Tube Terminology –

Radiation Detected – Geiger-Mueller tubes are typically designed to detect alpha, beta, and/or gamma radiation.

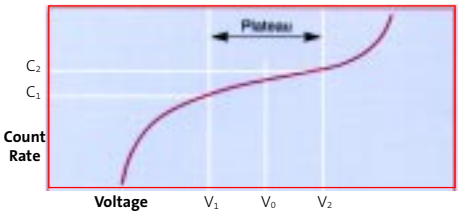
^{137}Cs Photon Response – As a point of sensitivity reference, the photon response to a 1 mR/h ^{137}Cs (662 keV) field is given for all standard G-M tubes listed. Many of our standard designs and particularly our energy compensated G-M tubes have been type tested at the National Radiological Protection Board (NRPB) for "side wall" and "polar" photon response from 20 keV to 6 MeV. Energy compensated tubes have been designed for either an air KERMA response or an ambient dose equivalent response, both flat to better than +/-20%. Detailed information can be found on specific data sheets.

Maximum Shielded Background – This is the maximum permissible count rate resulting from a G-M tube inside a lead chamber 2 inches thick, lined with aluminum.

Suggested Operating Voltage – See Figure 1. The Suggested Operating Voltage generally appears in the center of the plateau. One can deviate from this suggestion as long as the applied voltage is still on the plateau.

V_1 and V_2 = Plateau Voltage end points C_1 = Count Rate at V_1

V_0 = Suggested Operating Voltage C_2 = Count Rate at V_2

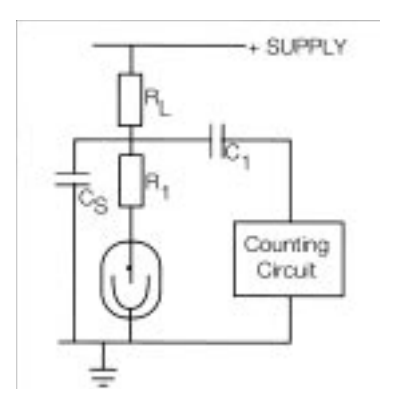


$$\text{Slope (\%/100V)} = \frac{(C_2 - C_1)}{(C_2 + C_1)/2} \times \frac{100}{(V_2 - V_1)} \times 100$$

Figure 1. Geiger-Mueller Plateau Curve

Maximum Plateau Slope – See Figure 1. The G-M tube Plateau Slope is defined as the percent change in sensitivity over a change in applied voltage. In this catalog, Plateau Slope is given by the percent change in sensitivity over 100 volts (%/100V).

Maximum Dead Time – Dead Time is the period of time a G-M tube is insensitive to another counting event (expressed in microseconds).



R_1 = Anode Resistor
R_L = Load Resistor
C_1 = High Voltage Coupling Capacitor
C_S = Stray Capacitance

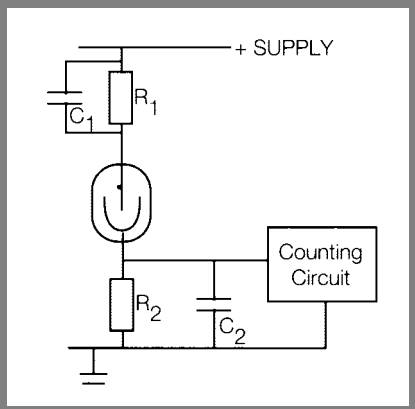
Figure 3 Anode Signal Circuit

Anode Signal Connection Circuit –

The Anode Connection should be used when the cathode needs to be grounded. The circuit capacitance added to the small anode capacitance may produce undesirable effects such as increased Dead Time.

Cathode Signal Connection Circuit –

The Cathode Connection circuit is preferred over the Anode connection because it is less likely to affect the operating characteristics of the G-M tube. The extra capacitance of the output circuitry added to that of the cathode is considerably less significant than the value added to the relatively small anode. Cathode pick-up also eliminates the need for a high voltage capacitor.



R_1 = Anode Resistor
$R_1C_1 = R_2C_2$
R_2 = Cathode Resistor

Figure 4 Cathode Signal Circuit

Specifications (continued) –

Dose Rate Limit – The Dose Rate Limit is the dose rate at which a particular G-M tube has reached its maximum count rate, but has not become saturated to a point where the count rate "turns down" (see Figure 2). All SGCD products will maintain a linear response to dose rates one decade less than the specified Dose Rate Limit. Dose Rate Limit information is seldom provided by other companies, but is very important when choosing G-M tubes. SGCD's miniature G-M tubes significantly exceed our competition in Dose Rate Linearity, and they are the industry's choice for high range instruments. It should be noted that circuit impedance can be a limiting factor in Dose Rate Linearity.

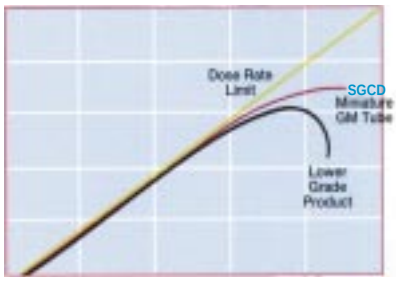


Figure 2 Dose Rate vs. Count Rate for a typical SGCD Miniature G-M Tube

Maximum/Effective Length and Diameter – Unless stated otherwise, the Maximum Length or Diameter includes all projections of the product. Refer to SGCD's individual data sheets for precise dimensions. The Effective Length and Diameter are the sensitive portions of the G-M tube cathode.

MIca Window and Cathode Wall Density Thickness – Density thickness (mg/cm^2) is a reference to the amount of radiation attenuating material which should be of concern for alpha and beta detection. In this catalog, some "thick wall" G-M tubes have been expressed in inches of stainless steel thickness.

Other Terms –

Starting Voltage – The Starting Voltage is the lowest applied voltage at which a particular G-M tube will produce a minimum count rate. Starting Voltage is dependent on the input threshold of a circuit and a chosen minimum count rate. For these reasons, SGCD has not published Starting Voltage in this catalog.

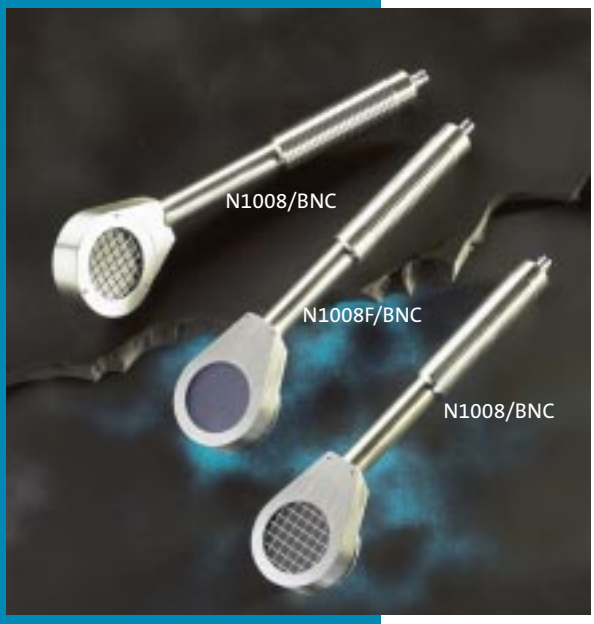
Input Threshold – The Input Threshold or Discriminator limits the minimum pulse height to be counted. Geiger-Mueller tubes produce relatively large voltage pulses compared to other types of radiation detectors. A typical threshold will be greater than 150 mV.

Application Circuits and External Quenching –

The output signal of a G-M tube can be taken from an RC network connected either in the Anode Circuit (Figure 3) or Cathode Circuit (Figure 4).

The design of the external circuit assists the quenching of a G-M tube. A simple passive quenching circuit consists of a high value Anode Resistor (R_1) in the main discharge circuit. This resistor increases the time constant of the recharge current path and thus allows a longer period with reduced voltage. This extended period of reduced voltage assists de-ionization because the time constant of the circuit then becomes much greater than the probable collection period of positive ions.

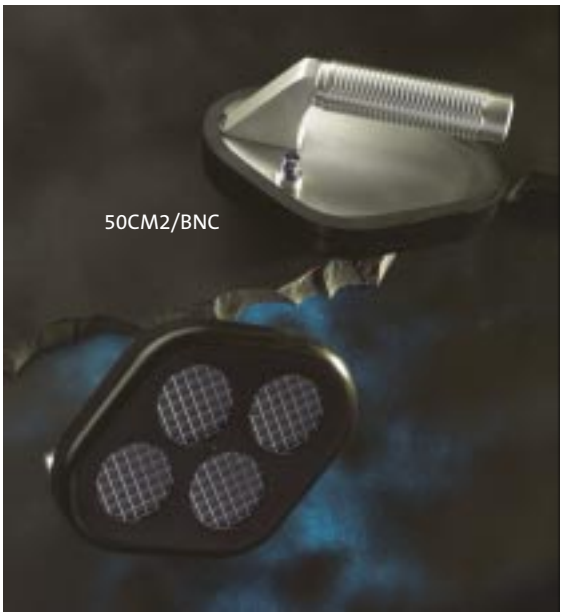
Cable Ready G-M Probes

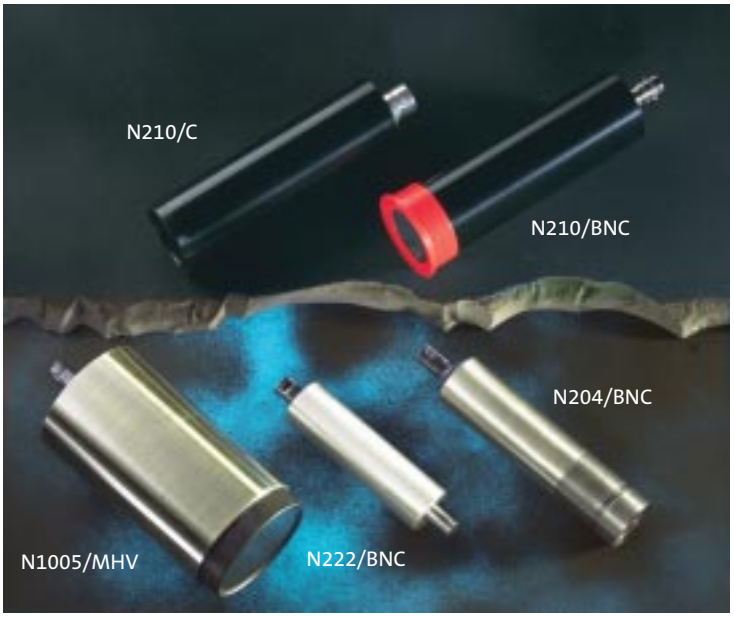


Cable Ready G-M Probes

SGCD Part Number	Radiation Detected	^{137}Cs Response (cpm/mR/h)	Max.Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
N204/MHV	α,β,γ	1250	9	900	150
N210/BNC	α,β,γ	2200	20	900	150
N222/BNC	α,β,γ	500	4	900	100
N378S/BNC	γ	8500	90	450	100
N1003/BNC	α,β,γ	1500	8	900	100
N1004/BNC	α,β,γ	1500	8	500	100
N1005/MHV	α,β,γ	3350	25	900	150
N1008/BNC	α,β,γ	3350	25	900	150
50CM2/BNC	α,β,γ	13400	100	900	150

Notes: (1) Alternate cable connectors available: BNC, MHV, C.
(2) Supplied with SGCD N1002/8767 Pancake G-M tube(s). See specifications.

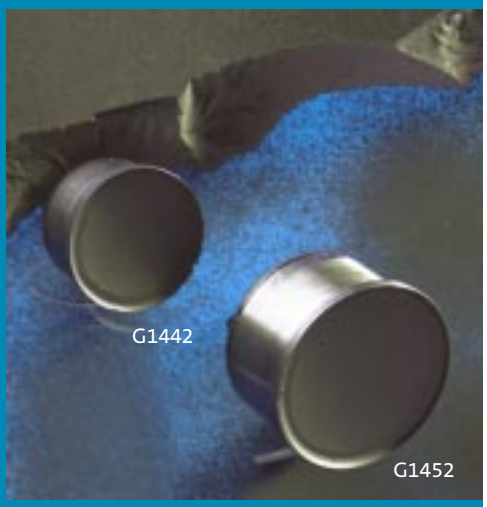




Maximum Plateau Slope (%/100 V)	Max. Dead Time (µsec)	Dose Rate Limit (R/h)	Max./Effective Length (inches)	Max./Effective Window Dia. (inches)	Mica Window Density Thickness (mg/cm²)	Termination	Notes
8	150	0.5	4.1 / 1.4	1.0 / 0.78	3.0 - 3.5	MHV	(1) (4)
10	200	0.2	4.5 /2.5	1.4 / 1.2	1.8 / 2.0	BNC	(1) (4)
8	60	2	3.6 / 0.93	0.93 / 0.25	1.4 - 2.0	BNC	(1) 4)
15	200	0.01	12.3 / 9.4	1.3 / 0.90	—	BNC	(1) (4)
5	60	2	4.5 / 0.38	1.4 / 1.2	1.8 - 2.0	BNC	(1) (4)
5	60	2	4.5 / 0.38	1.4 / 1.2	1.8 - 2.0	BNC	(1) (4)
10	100	1	3.0 / 0.42	2.3 / 1.8	1.8 - 2.0	MHV	(1) (4)
10	100	1	10.7 / 0.42	2.5 / 1.8	1.8 - 2.0	BNC	(1) (2) (3) (4) (5)
10	100	1	7.1 / 5.4	—	1.8 - 2.0	BNC	(1) (2) (3) (4) (5)

(3) Available with 500 volt operation.
(4) Maximum length does not include cable connector.
(5) Fine mesh screen available.

Mica Window G-M Tubes



The mica window built into these G-M tubes allows beta particles and high energy alpha particles, as well as low dose gamma radiation, to enter the detector. Configurations available include end-window and pancake styles.

Mica window detectors are suitable for monitoring in a wide variety of environments.

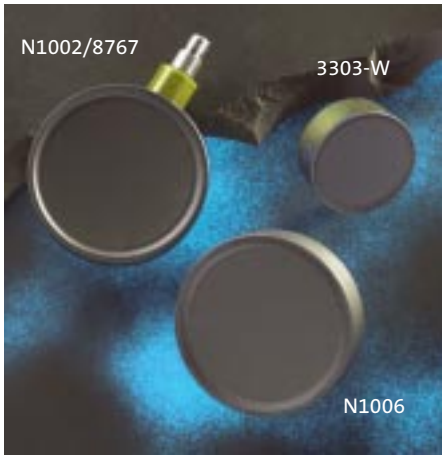
Mica Window Pancake G-M Tubes

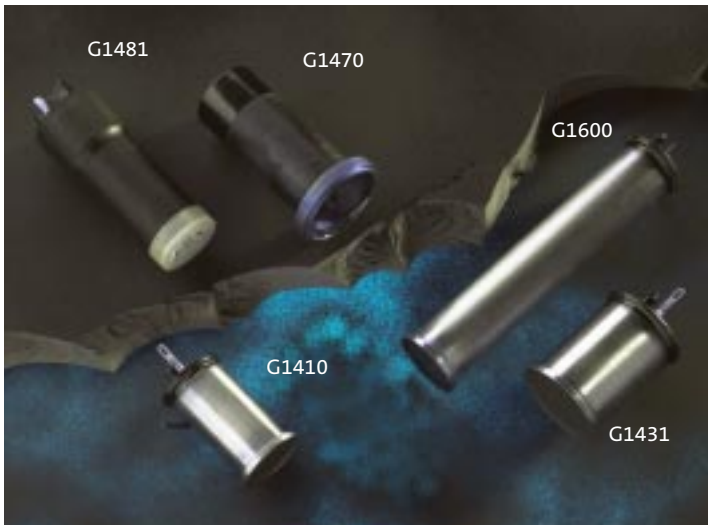
SGCD Part Number	Anode Resistor (minimum)	Radiation Detected	^{137}Cs Photon Response (cpm/mR/h)	Max. Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
N1002/8767	3•3MΩ	α,β,γ	3350	25	900	150
3303-W	3•3MΩ	α,β,γ	1500	8	900	100
N1006	3•3MΩ	α,β,γ	3350	25	900	150
G1442	2•2MΩ	α,β,γ	800	8	600	200
G1452	4•7MΩ	α,β,γ	1700	18	625	200
G1490	4•7MΩ	α,β,γ	1500	15	575	200

Mica End Window G-M Tubes

SGCD Part Number	Anode Resistor (minimum)	Radiation Detected	^{137}Cs Photon Response (cpm/mR/h)	Max. Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
N201	1MΩ	α,β,γ	2700	25	900	150
1504-W	10MΩ	α,β,γ	1200	12	500	150
N210-1	1MΩ	α,β,γ	2200	20	900	100
N222	1MΩ	α,β,γ	500	4	900	100
N1005	3•3MΩ	α,β,γ	3350	25	900	150
G1410	2•2MΩ	α,β,γ	1700	15	575	200
G1431	4•7MΩ	α,β,γ	2300	25	575	200
G1470	2•7MΩ	α,β,γ	2000	25	625	150
G1481	2•7MΩ	α,β,γ	1250	30	450	100
G1600	4•7MΩ	X (6-20 keV)	—	25	1800	400

Notes: (1) Overall length includes anode pin projection.
(2) Available with either BNC, MHC or C connectors as a Cable Ready Probe.





Maximum Plateau Slope (%/100 V)	Max. Dead Time (µsec)	Dose Rate Limit (R/h)	Max. / Effective Length (inches)	Max. / Effective Window Dia. (inches)	Mica Window Density Thickness (mg/cm²)	Termination	Notes
10	100	1	3.0 / 0.42	2.1 / 1.8	1.8 - 2.0	Single Pin	(2) (6)
10	60	2	1.1 / 0.38	1.3 / 1.2	1.8 - 2.0	Flying leads	(2)
10	100	1	1.2 / 0.42	2.1 / 1.8	1.8 - 2.0	Flying leads	(2) (6)
9	65	10	1.2 / 0.47	1.0 / 0.78	2.0 - 3.0	Anode Clip	(1) (3) (5)
7	60	2	1.3 / 0.63	1.3 / 1.1	2.0 - 3.0	Anode Clip	(1) (3) (5)
6	55	2	1.1 / 0.31	1.3 / 1.1	1.5 - 2.0	Anode Clip	(1) (3)

Maximum Plateau Slope (%/100 V)	Max. Dead Time (µsec)	Dose Rate Limit (R/h)	Max. / Effective Length (inches)	Max. / Effective Window Dia. (inches)	Mica Window Density Thickness (mg/cm²)	Termination	Notes
15	150	0.5	5.9 / 4.0	1.0 / 0.78	1.4 - 1.8	Single Pin	(1)
6	90	10	2.0 / 1.3	0.59 / 0.50	2.0 - 3.0	Anode Clip	(1) (3)
10	200	0.2	4.3 / 2.5	1.4 / 1.2	1.8 - 2.0	4-Pin	(1) (2)
8	60	2	2.1 / 0.93	0.34 / 0.25	1.4 - 2.0	Single Pin	(1) (2)
10	100	1	4.4 / 0.42	2.2 / 1.8	1.8 - 2.0	4-Pin	(1) (2)
4	175	1	2.2 / 1.5	1.0 / 0.78	1.5 - 2.0	Anode Clip	(1) (3)
4	230	0.7	2.2 / 1.5	1.3 / 1.1	2.0 - 3.0	Anode Clip	(1) (3) (5)
15	70	2	2.7 / 1.0	1.4 / 0.95	1.5 - 2.5	Anode Clip	(1) (3)
20	120	2	3.2 / 1.5	0.94 / 0.67	2.5 - 3.0	—	(1) (4)
7	110	—	5.0 / 4.2	1.0 / 0.78	2.5 - 3.5	Anode Clip	(1) (3)

(3) Supplied with anode clip and cathode strap.
(4) Available with a B2A base.
(5) Available with 1.5-2.0 cm² mica.
(6) 500 volt operation available

Miniature G-M Tubes

This series of G-M tubes is appropriate for the detection of beta and gamma radiation at low to high dose rates. Miniature tubes are particularly useful in health physics applications such as personal dosimetry, survey instruments and area monitors.

Miniature G-M Tubes

SGCD Part Number	Anode Resistor (minimum)	Radiation Detected	^{137}Cs Photon Response (cpm/mR/h)	Max. Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
N302	1MΩ	γ	125	4	900	100
G300	2·2MΩ	β,γ	9	1	575	150
G1300	2·2MΩ	β,γ	19	1	550	100
G1310	2·2MΩ	β,γ	85	2	575	150
G1320	2·2MΩ	β,γ	475	12	575	150
G1200	4·7MΩ	γ	1400	10	500	200

Energy Compensated Miniature G-M Tubes *(Please call for Energy Response Curves)*

SGCD Part Number	Anode Resistor (minimum)	Radiation Detected	^{137}Cs Photon Response (cpm/mR/h)	Max. Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
C301	2·2MΩ	γ	9	1	625	150
G1201	4·7MΩ	γ	1400	10	500	200
G1301	2·2MΩ	γ	16	1	550	100
G1313	2·2MΩ	γ	85	2	575	150
G1321	2·2MΩ	γ	475	12	575	150

Notes: (1) Supplied with anode clip and nickel cathode strap.
(2) Maximum length includes anode pin projection.
(3) Available with beta calibration hole.
(4) Ambient dose equivalent filter available.

Maximum Plateau Slope (%/100 V)	Max. Dead Time (µsec)	Dose Rate Limit (R/h)	Max. / Effective Length (inches)	Max. / Effective Diameter (inches)	Cathode Density Thickness (mg/cm²)	Termination	Notes
15	20	20	1.9 / 0.31	0.35 / 0.31	—	Single Pin	(2)
20	7	3000	0.90 / 0.39	0.17 / 0.13	95-135	Anode Clip	(1) (2)
30	11	2000	1.0 / 0.31	0.24 / 0.19	80-100	Anode Clip	(1) (2)
15	15	400	1.4 / 0.63	0.24 / 0.19	80-100	Anode Clip	(1) (2)
10	28	20	2.0 / 1.10	0.39 / 0.31	30-40	Anode Clip	(1) (2)
4	90	10	2.2 / 1.6	0.67 / 0.57	250	Anode Clip	(1) (2)

Maximum Plateau Slope (%/100 V)	Max. Dead Time (µsec)	Dose Rate Limit (R/h)	Max. / Effective Length (inches)	Max. / Effective Diameter (inches)	Cathode Wall Density Thickness (mg/cm²)	Termination	Notes
20	7	10,000	1.1 / 0.39	0.32 / 0.13	95-31	Anode Clip	(1) (2)
4	110	10	2.3 / 1.6	0.77 / 0.57	250	Anode Clip	(1) (2) (4)
30	13	2,000	0.91 / 0.28	0.54 / 0.19	80-100	Anode Clip	(1) (2) (3) (4)
15	15	400	1.5 / 0.63	0.35 / 0.19	80-100	Anode Clip	(1) (2) (3) (4)
8	55	10	2.1 / 1.10	0.55 / 0.31	30-40	Anode Clip	(1) (2) (3) (4)

Cylindrical G-M Tubes

Cylindrical G-M tubes are sensitive to gamma radiation at low dose rates.

Thin-wall cylindrical G-M tubes are machined so that the cathodes have very thin areas. High energy beta particles can enter the tube at these thin-wall regions, making these particular tubes sensitive to both gamma and high energy beta particles.

Cylindrical Thin Wall G-M Tubes

SGCD Part Number	Anode Resistor (minimum)	Radiation Detected	^{137}Cs Photon Response (cpm/mR/h)	Max. Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
N106/3P	1MΩ	β,γ	2200	30	900	150
N107/3P	1MΩ	β,γ	5200	60	900	150
N108/3P	1MΩ	β,γ	3300	35	900	150
N112	1MΩ	β,γ	1500	20	900	150
N112HS	1MΩ	β,γ	2000	25	900	150
N112X	1MΩ	β,γ	1100	20	900	150
N114	1MΩ	β,γ	800	12	900	100
N119HS	1MΩ	β,γ	4800	50	900	150

Cylindrical Thick Wall G-M Tubes

SGCD Part Number	Anode Resistor (minimum)	Radiation Detected	^{137}Cs Photon Response (cpm/mR/h)	Max. Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
N309/3P	3•3MΩ	γ	2200	30	900	100
N310/3P	3•3MΩ	γ	4700	50	900	100
G1200	10MΩ	γ	1400	10	500	200
G1210	2•7MΩ	γ	5200	70	450	100
G1220	2•7MΩ	γ	9000	90	450	100

Notes:
(1) Available with 3-pin, 4-pin base or flying leads.
(2) Maximum length includes anode pin projection.
(3) Includes anode clip and nickel cathode strap.
(4) 700 volt operation available.

Maximum Plateau Slope (%/100 V)	Max. Dead Time (µsec)	Dose Rate Limit (R/h)	Max. / Effective Length (inches)	Max. / Effective Diameter (inches)	Cathode Wall Density Thickness (mg/cm²)	Termination	Notes
8	100	1	5.6 / 3.8	0.63 / 0.60	40-60	3-Pin	(1) (2) (5)
8	100	1	10.8 / 8.9	0.63 / 0.60	40-60	3-Pin	(1) (2) (5)
8	100	1	7.9 / 5.7	0.63 / 0.60	40-60	3-Pin	(1) (2) (5)
8	150	1	4.3 / 2.3	0.94 / 0.73	40-60	Single Pin	(1) (2)
8	150	0.5	4.3 / 2.3	0.94 / 0.73	40-60	Single Pin	(1) (2)
8	150	1	4.3 / 2.3	0.94 / 0.73	40-60	Single Pin	(1) (2)
10	100	2	3.8 / 1.2	0.63 / 0.60	40-60	3-Pin	(2)
8	150	0.5	7.4 / 5.5	0.94 / 0.73	40-60	Single Pin	(1) (2)

Plateau Slope (%/100 V)	Max. Dead Time (µsec)	Dose Rate Limit (R/h)	Max. / Effective Length (inches)	Max. / Effective Diameter (inches)	Cathode Wall Density Thickness (mg/cm²)	Termination	Notes
8	100	1	4.5 / 2.7	0.63 / 0.60	—	3-Pin	(1) (2) (4)
8	100	1	7.8 / 5.8	0.63 / 0.60	—	3-Pin	(1) (2) (4)
4	90	10	2.2 / 1.6	0.67 / 0.57	250	Anode Clip	(2) (3)
15	200	1	6.7 / 5.51	0.94 / 0.90	525	Flying Leads	
15	210	0.3	10.6 / 9.5	0.94 / 0.90	525	Flying Leads	(6)

(5) 150°C high temperature operation available.
(6) 11 cpm low background available.

High Sensitivity G-M Tubes

Lining the cathode with platinum, a “high Z” material, increases the G-M tube’s radiation sensitivity .

These tubes are commonly used in high temperature, high vibration environments, i.e., oil well logging and density gauging.

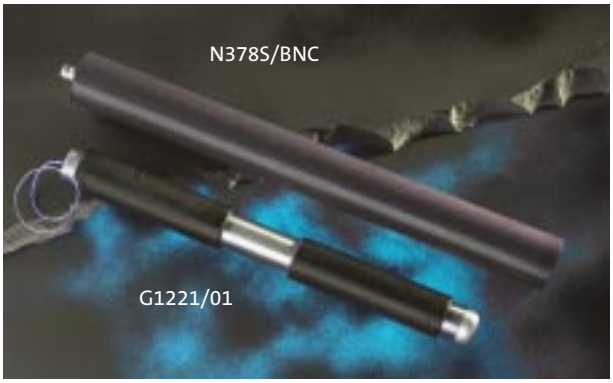
High Sensitivity Energy Compensated G-M Tubes

SGCD Part Number	Anode Resistor (minimum)	Radiation Detected	^{137}Cs Photon Response (cpm/mR/h)	Max. Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
N378S/BNC	2•7MΩ	γ	9000	90	450	100
G1221/01 (2)	2•7MΩ	γ	9000	11	450	100

High Sensitivity Platinum Lined G-M Tubes

SGCD Part Number	Anode Resistor (minimum)	Radiation Detected	^{137}Cs Photon Response (cpm/mR/h)	Max. Shielded Background (cpm)	Suggested Operating Voltage (volts)	Minimum Plateau Length (volts)
NP315-4	5MΩ	γ	1100	10	700	100
NP315-6	5MΩ	γ	2200	20	700	100
NP315-8	5MΩ	γ	3300	30	700	100
NP322-2	1MΩ	γ	600	7	550	100
NP334-6(1915-PT)	5MΩ	γ	5800	25	900	150
NP334-6.6(1916-PT)	5MΩ	γ	6350	25	1000	150
NP334-8	5MΩ	γ	8500	30	900	150
NP358-1.8	5MΩ	γ	2600	8	700	100
NP358-6	5MΩ	γ	5500	20	700	100
NP358-8(1620-PT)	5MΩ	γ	8500	30	700	100
NP358-9.1(1625-PT)	5MΩ	γ	12850	30	950	150
07025	5MΩ	γ	12000	80	750	150
1611-PT	5MΩ	γ	5000	20	900	150

Notes: (1) Available with 3-pin base or flying leads.
(2) Ambient dose equivalent filter available.
(3) 1050 volt operation available.
(4) 150°C operation available.



Maximum Plateau Slope (%/100 V)	Max. Dead Time (µsec)	Dose Rate Limit (R/h)	Max. / Effective Length (inches)	Max. / Effective Diameter (inches)	Cathode Wall Density Thickness (mg/cm²)	Termination	Notes
15	200	1	12.3 / 9.4	1.3 / 0.90	525	BNC	(6)
15	210	0.3	10.6 / 9.45	1.10 / 0.90	525	Flying Leads	(2)

Maximum Plateau Slope (%/100 V)	Max. Dead Time (µ sec)	Dose Rate Limit (R/h)	Max. / Effective Length (inches)	Max. / Effective Diameter (inches)	Cathode Wall Thickness (inches)	Termination	Notes
8	80	1	4.1 / 2.0	0.29 / 0.25	0.020	Threaded Pin	(3) (4) (5)
8	80	1	6.2 / 4.1	0.29 / 0.25	0.020	Threaded Pin	(4) (5)
8	80	1	8.4 / 6.3	0.29 / 0.25	0.020	Threaded Pin	(4) (5)
8	80	1	2.2 / 1.2	0.35 / 0.25	0.050	Single Pin	(4) (5)
5	150	1	6.1 / 5.1	0.75 / 0.73	0.010	Flying Leads	(1) (4) (5)
5	150	1	6.9 / 5.6	0.75 / 0.73	0.010	Single Pin	(1) (4) (5)
5	100	1	8.6 / 7.5	0.75 / 0.73	0.010	Flying Leads	(1) (4) (5)
8	100	0.5	2.9 / 1.8	0.62 / 0.60	0.010	Flying Leads	(4) (5)
5	100	1	6.1 / 5.0	0.62 / 0.60	0.010	Flying Leads	(1) (3) (4) (5)
5	100	1	8.1 / 7.0	0.62 / 0.60	0.010	Flying Leads	(1) (4) (5)
5	100	1	10.4 / 9.0	0.62 / 0.60	0.010	Flying Leads	(1) (4) (5)
8	100	1	19 / 16	0.41 / 0.37	0.050	Threaded Pin	(4) (5)
5	100	1	5.75 / 4.0	0.62 / 0.60	0.010	3-Pin	(1) (4) (5)

(5) Overall length includes anode pin projection.
(6) Overall length does not include cable connector.

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