Daedalon®

EN-01 GEIGER TUBE

The end window halogen Geiger tube mounts in a cylindrical metal housing for protection and connects to the Counter with a shielded cable terminated with color coded banana plugs. The Geiger tube will respond to alpha (α), beta (β), and gamma (γ) radiation and operates at a comparatively low voltage (450 VDC). The window has a density of 1.5- 2mg/cm^2 so that readings from low energy sources are possible. The end window is mica and is 9 mm in diameter. The dead time, i.e., the time required for the tube to deionize and become sensitive again is 90μs. This value is not likely to be significant for student laboratory sources.

Operation

1. Remove the Geiger tube and cord from its package. The Geiger tube is recessed inside the metal tube to protect the delicate end window on the end of the Geiger tube.

Do not touch the end window of the Geiger tube. It is very easily broken and cannot be repaired.

2. The protecting tube has a nylon ring fastened to the end. The ring adapts the EN-01 to the mounting hole in the EN-06 Geiger Tube Stand. If the stand is not used, the ring can be removed. Assemble the tube in the experiment with the radioactive source and absorbers. The tube is sensitive to α,β,and γsources.

3. Turn off the Geiger counter. Select the correct voltage. The EN-15 Geiger Counter has two voltage outputs, 450V and 900V. Select 450V and connect the Geiger tube to the input jacks. Observe the correct polarity. The EN-30 Geiger Counter has a continuously adjustable output voltage. Turn the "Voltage Adjust" to its extreme counter-clockwise position. Connect the Geiger tube to the input jacks on the rear panel.

4. Turn on the Geiger counter. The EN-15 is ready to count and will likely show some background count even if there is no source near it. The EN-30 Precision Geiger Counter needs to have the tube voltage set. To do this press the "Mode" switch until it is in the Voltage Mode, so that the display shows the tube voltage. Turn the "Voltage Adjust" until the display indicates 450V. Press the "Mode" switch to one of the counting modes.

5. Reset the display to zero. The Geiger tube is now active and should show random counts due to natural radioactivity.

All Geiger tubes are sensitive to their operating voltage. They have a wide region, the plateau, where this sensitivity is not significant. Below this region the sensitivity falls off very rapidly, while above this region the tube begins to break down. In this excessive voltage region the count rate is very high and erratic and the tube is in danger of permanent damage.

The voltage characteristics of the EN-01 Geiger Tube are shown in fig.1. The manufacturer's voltage rating for this tube is 450V, but the data shows that it will operate satisfactorily from 400 to 550V. The rise in count rate beyond 600V is the beginning of the breakdown region and should be avoided.

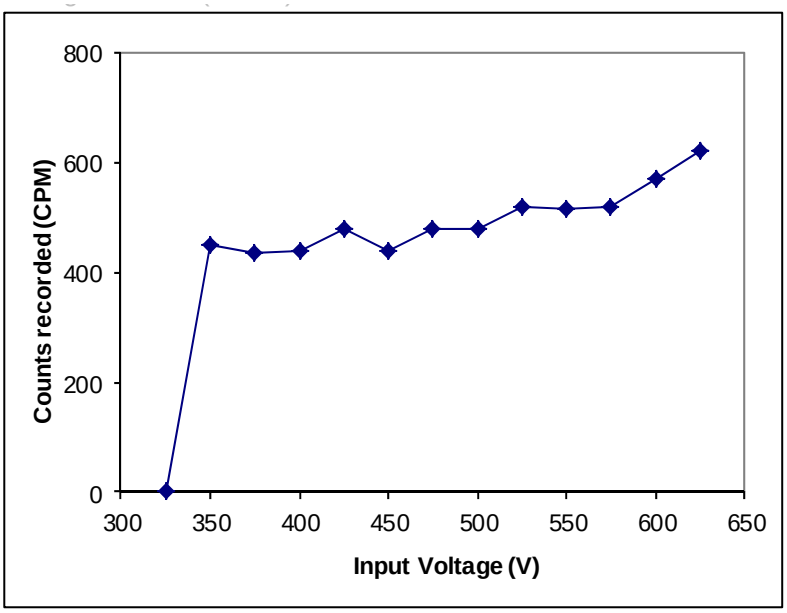

Figure 1. Count Rate versus Voltage

Specifications

Type	End window halogen quenched $\alpha, \beta,$ and γ radiation counter tube.
Window Density	1.5 – 2mg/cm^2, mica window.
Window Diameter	9.1mm
Operating Voltage	400-550Vdc
Plateau Slope	6%/100V
Limiting Values	
Anode Resistor	4.7megohms Minimum
Anode Voltage	600Vdc Maximum
Dimension	1.9cm x 8.9cm
Cable Length	90cm
Connector	Color-coded banana plugs on a shielded cable
Weight	0.1kg