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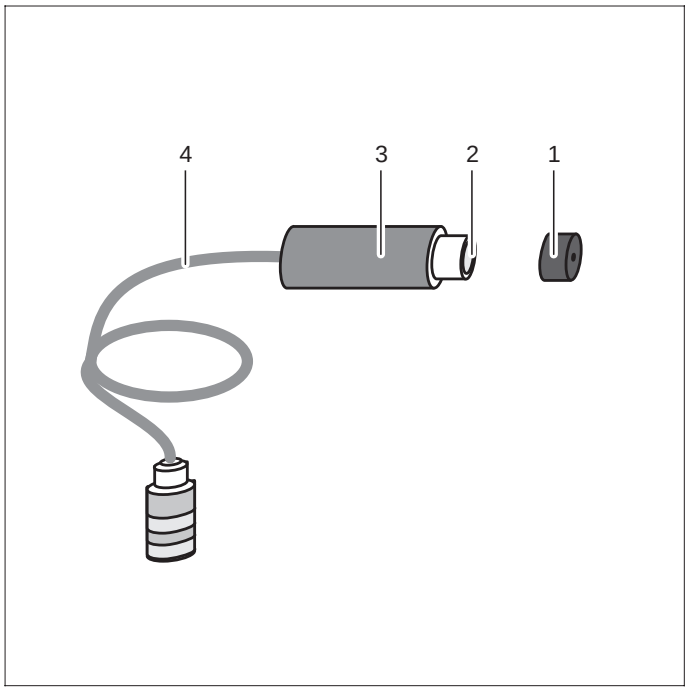

Instruction Sheet 559 01

End-window counter for α, β, γ Radiation and X-rays (559 01)

1 Window cap
2 Window
3 Geiger-Müller counter tube
4 Coaxial cable with plug

Important:

The window is fragile and can be easily damaged. Damage to the window will make the end-window counter inoperable.

- Do not touch the window.
- Always store the end-window counter with the protective cap attached.
- Remove the protective cap only when measuring.
- Remove and replace the cap carefully; do not turn it and do not block the vent hole.

The end-window counter can be damaged by self-maintained gas discharges if operated at too high a voltage.

- Do not exceed the maximum operating voltage of 600 V in a sustained manner.

1 Description

The end-window counter is a self-quenching Geiger-Müller counter tube with a very thin mica window (d = 12 - 15 μm). It is used to detect α and β radiation, and can also be used to measure γ and x-ray radiation.

2 Operation

Recommended display and counting devices with integrated supply voltage:

Counter P (digital display, loudspeaker)	575 45
GM-counter S (digital display)	575 46
Counter S (digital display, loudspeaker)	575 47
Digital counter (digital display, loudspeaker)	575 48
CASSY® computer interface device with GM box	524 033
X-ray apparatus (input: GM Tube)	554 811

- Place the end-window counter in the beam path (mechanically mount the apparatus e.g. using the large spring clip (591 21) and connecting rod (532 16) or the counter-tube holder from the STM equipment set RAD1 (588 855)).
- Connect the end-window counter to a suitable display and counting device with built-in voltage supply (approx. 500 V).
- Be sure to take the background effect into consideration for low counting rates.
- Take the dead time into consideration for high counting rates.

3 Technical data

Physical data:

Type:	Self-quenching Geiger-Müller counter tube
Gas filling:	neon/argon/halogen
Energy range:	≥ 3.5 MeV (α radiation) ≥ 50 keV (β radiation) ≥ 2.5 keV (γ and x-ray radiation)
Background effect in plateau	≤ 7 pulses/min (for screening with 50 mm Pb and 3 mm Al)
Length of active volume:	36 mm
Diameter of cathode:	13 mm
Diameter of anode:	1 mm

Window:

Material:	mica
Diameter:	11 mm
Mass per unit area:	1,5 ... 2 mg cm^{-2}
Reduction of range for α radiation:	approx. 1.4 cm through air

Electrical data:
(measured at 25 °C and 10^4 pulses/min with Sr-90/Y-90 source)

Cutoff voltage:	350-380V
Mean operating voltage:	approx. 500 V
Maximum permissible operating voltage:	approx. 600 V
Plateau length:	approx. 200 V
Relative plateau slope:	≤ 4 % / 100 V
Dead time:	≤ 90 ms
≥ expected service life:	$6 \cdot 10^{10}$ pulses
Working resistance:	10 MΩ

Cable:

Length:	55 cm
Thickness:	3 mm
Coaxial plug type:	Amphenol-Tuchel T 3162/1

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