

Dosimetry Diode E Type 60017

Waterproof silicon detector for dosimetry in high-energy electron and photon beams

The 60017 Dosimetry Diode E is ideal for dose measurements in small electron and photon fields as encountered in IORT, IMRT and stereotactic beams. The excellent spatial resolution makes it possible to precisely measure beam profiles in the penumbra region of small fields. The superior energy response enables the user to perform accurate percentage depth dose measurements which are field size independent up to field sizes of 40 x 40 cm². The detector is waterproof and can be used in water, air and solid state phantom material.

- ▶ Useful for measurements in all electron fields and for small photon fields
- ▶ Excellent spatial resolution
- ▶ Minimized energy response
- ▶ Thin entrance window for measurements in the vicinity of surfaces and interfaces

Specifications

Type of product.....	P-type silicon diode
Measuring quantity.....	Absorbed dose to water
Reference radiation.....	⁶⁰ Co
Sensitive volume.....	0.03 mm ³ (nominal)
Design.....	Waterproof, disk-shaped sensitive volume perpendicular to detector axis
Reference point.....	On detector axis, 0.77 mm from detector tip
Nominal response.....	9 nC/Gy
Dose stability.....	≤ 0.5% / kGy at 6 MV 1% / kGy at 15 MV ≤ 0.5% / kGy at 5 MeV ≤ 4% / kGy at 21 MeV
Temp. response.....	≤ 0.4% / K



Energy response.....	At higher depths than d_{max} , the percentage depth dose curves match curves measured with ionization chambers within ±0.5%
Signal polarity.....	Negative
Detector bias.....	0 V
Directional.....	≤ ±0.5% for rotation around the chamber axis,
response	in water
	≤ ±1% for tilting ≤ ±20°
Leakage current.....	≤ ±50 fA
Cable leakage.....	≤ ±1 pC/(Gy·cm)

Materials and measures

Entrance window.....	0.3 mm RW3 1.045 g/cm ³ 0.4 mm epoxy
Total window.....	140 mg/cm ²
area density	
Water-equivalent.....	1.33 mm
window thickness	
Sensitive volume.....	1 mm ² circular 30 μm thick
Outer dimensions.....	7 mm diameter 45.5 mm length

Useful ranges

Radiation quality.....	6 to 25 MeV electrons Co-60 to 25 MV photons
Field size.....	1 x 1 to 40 x 40 cm ² , electrons 1 x 1 to 10 x 10 cm ² , photons
Temperature.....	10 to 40° C, 50 to 104° F
Humidity.....	10 to 80%, max 20 g/m ³