ISORAD-3™
Cylindrical Diode Detectors

The ISORAD-3™ is the only available cylindrical diode detector. The ISORAD-3™'s cylindrical design allows it to have nearly zero angular dependence along the axial axis, making it an ideal choice for tangential treatment cases where it is difficult to predict angle of incidence. ISORAD-3™'s are available in three photon energy ranges. Each energy range uses a different buildup material designed to give a reading at dmax; therefore no additional buildup is required. ISORAD-3™ reproducibility error is < 0.5% for measurements >1 cGy.

The ISORAD-3™ diode detectors are an advanced third generation design that can be used in any situation where a surface-mounted diode is needed to verify patient dose. They are particularly useful for tangential treatments where the angle of incidence is difficult or impossible to predict. These diodes can also be used in conjunction with solid phantoms to verify complex treatment plans. The detectors are not waterproof, as they are designed for patient dose detection.

The ISORAD-3™ offers exceptional accuracy. When tested in air or in a cylindrical phantom for all the beams, the variation in Axial response is only +/- 1.0% from 0° ~ 360°. When tested on top of a 6 cm piece of Solid or Virtual Water, variation is still only +/- 1.0% from -60° ~ 60° for 6 MV and 18 MV.

As with any diode, ISORAD-3™ sensitivity will gradually change over time. This rate of change will depend on the energies used and the frequency of use. With normal use, plan on re-calibration once per year. Note that ISORAD-3™ life expectancy is not limited by radiation exposure – in fact, the more an ISORAD-3™ is used, the less its response characteristics will change. Life expectancy is an issue of proper handling and care. Broken coaxial connectors and cables are the most common cause of failure. When handled properly, the ISORAD-3™ should be expected to last greater than 1,000,000 cGy accumulated dose.

Accessories

2BM-F10 10 m coax extension cable, with BNC connectors

Features:

- Cylindrical geometry, angular corrections not required
- High impedance for minimum drift
- High output 27 nC/Gy typical
- Outstanding stability <0.1%/kGy at 6 MV photon beam
- Available in various water equivalencies for photons
- Reproducibility is less than 0.5% for measurements >1 cGy

Isorad-3™ Diode Detectors

Modality	Model (neg)*	Optimal energies	Buildup (g/cm²)	Buildup Material	Color Code
Photons	1162-000-0	1 - 4 MV	1.0	brass	blue
	1163-000-0	6 - 12 MV	1.6	moly	gold
	1164-000-0	15 - 25 MV	2.6	tungsten	red

* Positive polarity detectors available upon request.

Specifications

Detector type: ..... n-type diode
Detector size: ..... 1 mm diameter
Sensitivity: ..... 27 nC/Gy
Impedance: ..... >100 MΩ at 10 mV at 22°C at 10mV reverse bias
Output polarity: ..... negative
Output stability: ..... 1% loss of sensitivity at 1000 Gy, 10 MeV electron beam 0.1% loss of sensitivity at 1000 Gy, 6 MV photon beam
Axial response: ..... +/- 0.5% from 0 to 360°
Temp. coefficient: ..... ≅0.5%/°C
Construction: ..... cylindrical, 7.1 mm diameter
Radiation hardening: ..... special technique
Cable: ..... 3 meter low-noise coax, 2.5 mm thick
Connector: ..... coax BNC male

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