



PS-50 and PS-10 Spherical Chambers

Types 32007S, 32008S

Primary standard spherical ionization chambers for radiation protection measurements

Features

- ▶ Vented sensitive volumes of 50 cm³ and 10 cm³
- ▶ Suitable as primary standard for radiation protection measurements
- ▶ Exact volume individually determined
- ▶ Designed in collaboration with the National Institute of Standards and Technology (NIST)

The spherical graphite chambers PS-50 and PS-10 are vented ionization chambers for the use as primary standard for radiation protection measurements and for absolute dosimetry. The spherical graphite chambers have been designed in collaboration with the Radiation Interactions and Dosimetry Group at the National Institute of Standards and Technology (NIST). The exact volume of each chamber is individually determined. The homogeneity of the walls and electrodes is 0.06 mm. The chambers are constructed with a long rigid stem of approx. 29 cm length for easy mounting in the radiation beam. Air density correction is required for each measurement.

Specification

Type of product	vented spherical ionization chambers
Application	primary standard for radiation protection measurements
Measuring quantity	air kerma, photon equivalent dose
Nominal sensitive volume	50 cm ³ (32007S) 10 cm ³ (32008S)
Design	not waterproof, vented
Reference point	chamber center
Nominal response	1.73 μC/Gy (32007S) 0.349 μC/Gy (32008S)
Chamber voltage	1000 V nominal (32007S) 500 V nominal (32008S) ± 1000 V maximal
Directional response in air	≤ ± 0.5 % for rotation around the chamber axis and ≤ ± 1 % for tilting the chamber axis up to ± 60° (32007S) ≤ ± 1 % for tilting the chamber axis up to ± 50° (32008S)
Leakage current	≤ ± 5 fA

Materials and measures:

Wall of sensitive volume	3.5 mm graphite
Total wall area density	647 mg/cm ²
Central electrode	graphite, diameter 3 mm
Outer dimensions	diameter 53 mm (32007S) diameter 34 mm (32008S)

Ion collection efficiency at nominal range:

Ion collection time	8.7 ms (32007S) 1.9 ms (32008S)
Max. dose rate for ≥ 99,5 % saturation	(32007S), (32008S) 1.23 mGy/s, 26 mGy/s
≥ 90 % saturation	2.46 mGy/s, 52 mGy/s
Max. dose per pulse for ≥ 99.5 % saturation	(32007S), (32008S) 7.1 μG, 33 μGy
≥ 99.0 % saturation	14.2 μGy, 65 μGy

Useful ranges:

Chamber voltage	± (400 ... 1000) V
Radiation quality	⁶⁰ Co, ¹³⁷ Cs
Field size (square field)	≥ (6 x 6) cm ² (32007S) ≥ (4 x 4) cm ² (32008S)
Temperature	(10 ... 40) °C (50 ... 104) °F
Humidity	(10 ... 80) %, max 20 g/m ³
Air pressure	(700 ... 1060) hPa

Ordering information

TN32007S Spherical chamber PS-50,
connecting system BNT

TN32008S Spherical chamber PS-10,
connecting system BNT