



Radiation Products Design, Inc.

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**RPD is an
authorized distributor**

RPD Product Information

Item Number Description

300-660-BNC-M * PTW Model 31002 / 31010 - 0.125cc Semiflex Tube Chamber

IONIZATION CHAMBER TYPE 31002

Radiation Therapy

Diagnostic Radiology

Nuclear Medicine

Radiation Protection

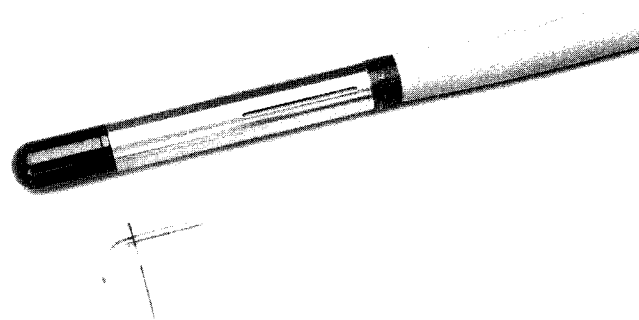
Semiflex Tube Chamber 0.125cm^3

Description

The 0.125 cm^3 ionization chamber type 31002 is designed for measurements in the useful beam of high energy photon or electron fields. The chamber is watertight and used mainly for relative measurements with a water phantom or air scanner for characterization of the radiation fields of therapy accelerators and teletherapy cobalt sources. The measuring volume is open to the surrounding air via cable and connector. The measuring volume is approximately spherical resulting in a flat angular response over an angle of 160° and a uniform spatial resolution during phantom measurements along all three axis. The chamber has a short rigid stem for mounting and a flexible connection cable.

Technical data

Volume:	0.125 cm^3
Response:	$4 \cdot 10^{-12}\text{ C/Gy}$
Leakage:	$\pm 4 \cdot 10^{-12}\text{ A}$
Polarizing voltage:	max. 500 V
Cable leakage:	$10^{-12}\text{ C/(Gy} \cdot \text{cm)}$
Wall material:	PMMA ($\text{C}_5\text{H}_8\text{O}_2$)
Wall density:	1.18 g/cm^3
Wall thickness:	0.70 mm
Area density:	82.6 mg/cm^2
Electrode:	Aluminium; 1 mm $\varnothing$; 5 mm long
Range of temperature:	$+10^\circ\text{C} \dots +40^\circ\text{C}$
Range of rel. humidity:	20 % ... 75 %
Ion collection time:	300 V: 0.15 ms 400 V: 0.10 ms 500 V: 0.08 ms



- Guard ring up to measuring volume
- Suitable for use in solid state phantoms and water phantoms
- Guard ring at potential of the collecting electrode. Touchable parts free of high voltage
- High voltage to be connected only with active current-limiting device ($I_{\text{max}} < 0.5\text{ mA}$)
- Open measuring volume, without check device air density correction is necessary
- Lengthening cable up to 100 m available

Saturation behaviour

	Polarizing voltage	99.0 % saturation	99.5 % saturation
Max. dose rate at continuous irradiation	300 V 400 V 500 V	9 Gy/s 16 Gy/s 25 Gy/s	4.5 Gy/s 8.0 Gy/s 12.0 Gy/s
Max. dose per irradiation pulse	300 V 400 V 500 V	0.7 mGy 0.9 mGy 1.2 mGy	0.3 mGy 0.4 mGy 0.5 mGy

PTW

PTW

IONIZATION CHAMBER TYPE 31002

Semiflex Tube Chamber 0.125cm³

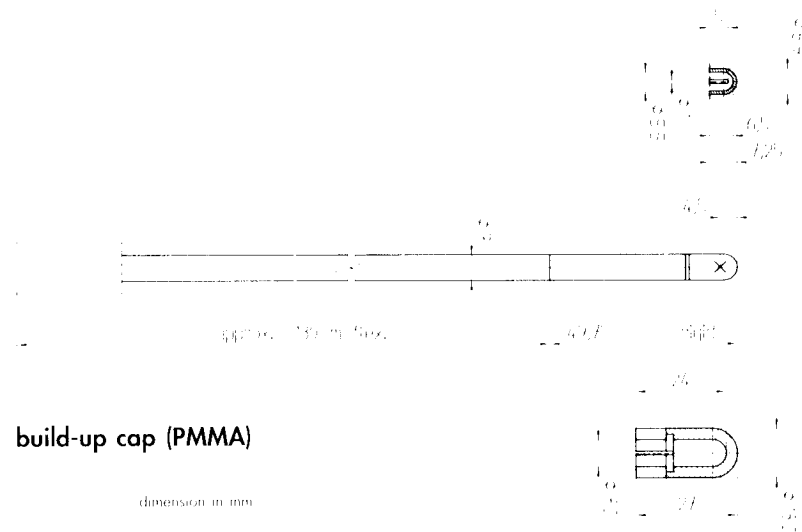
Radiation Therapy

Diagnostic Radiology

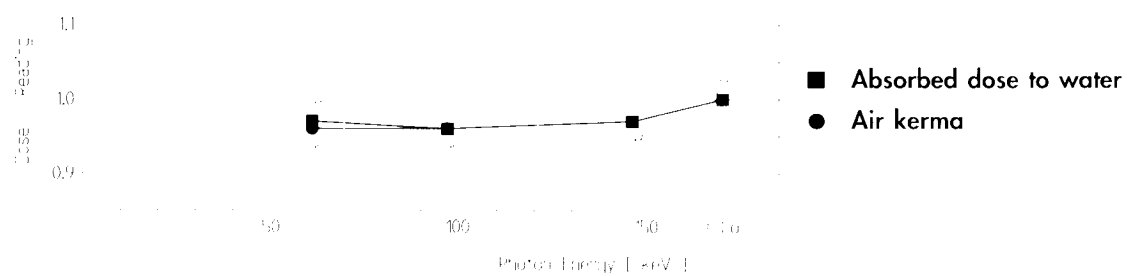
Nuclear Medicine

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Design

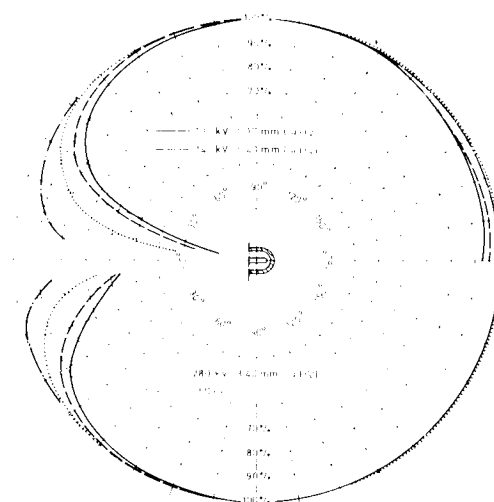


Energy Dependence



Directional Dependence

in air



in PMMA

Reading / Dose [%]

	6°	12°	18°	24°	30°	60°	90°	120°	150°	162°	174°	180°
100 kV	3	20	44	67	80	97	100	99	96	95	94	93
140 kV	10	32	55	76	87	99	100	99	97	97	96	96
280 kV	33	62	78	87	93	99	100	101	101	101	100	100
⁶⁰ Co	79	89	93	95	97	100	100	100	100	100	100	100

	6°	12°	18°	24°	30°	60°	90°	120°	150°	162°	174°	180°
100 kV	56	63	71	81	88	98	100	100	100	100	100	100
140 kV	58	68	77	87	93	99	100	100	100	100	100	100
280 kV	67	83	91	95	97	99	100	101	101	101	101	100
⁶⁰ Co	85	95	99	100	100	100	100	100	100	100	100	100

The values given in the diagrams are typical for the construction.

PTW