20X6 Chambers - Technical Specifications

20X6-6

General Purpose In Beam Chamber

The 20X6-6 chamber permits in-beam measurements as described in "Routine Compliance Testing for Diagnostic X-ray systems" (PB89-205215).

20X6-6M

Dedicated Mammography Chamber

Long before the Mammography Quality Assurance Standards Act, Radcal designed what proved to be one of the finest low energy chambers on the market. It's extraordinary flat energy response over 10 - 40 keV has been documented in technical papers 2,3 and makes corrections unnecessary. Unlike solid state detectors, the -6M's response is not influenced by tube target material or filtration.

20X6-60/60E

Service and Image Intensifier Chambers

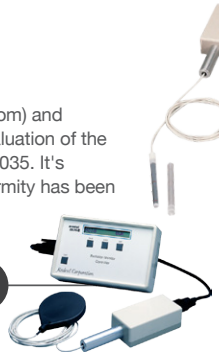
The dynamic range and thin profile of these chambers make them ideal for virtually all X-ray service applications (make sure the beam size is larger than the size of the detector):

- Input Dose at the Image Intensifier (lowest resolution is 1.7 µR/s)
- High dose rates encountered in Fluoroscopy
- Cine, spot film devices & other special procedures

Additionally, the -60E(xtended) chamber's increased sensitivity at lower energies turns the chamber into a "Universal" detector, covering mammography through R&F and beyond. The 8231 holder is recommended (please see accessories).

20X6-3CT

Computed Tomography Dose Index (CTDI) and DWP or DLP Chamber



When used in conjunction with Radcal's 20CT6 (head phantom) and Radcal's 20CT14 (body phantom) the 20X6-3CT permits evaluation of the radiation output as prescribed by HHS publication FDA 88-8035. It's excellent energy, partial volume response and position uniformity has been well documented 4,5.

for use with: *2026C*

20X6-180

Leakage and Low Level Measurements Chamber

The 20X6-180 ion chamber is designed for leakage measurements as described in "Regulations for the Administration and Enforcement of The Radiation Control for Health and Safety Act of 1968" (HHS Publication FDA 88-8035), and provides the required effective cross-section of 100 cm^2.

20X6-1800

Radiation Protection Chamber

The 20X6-1800 ionization chamber is intended for low-level radiation measurements such as shielding leakage, irradiator and environmental. Unlike typical survey meters, the 20X6-1800 chamber offers improved accuracy over a wider dynamic range.

20X6-0.18

High Dose Rate Chamber

The 20X6-0.18 ion chamber is intended for in-beam measurements of high-intensity gamma radiation. It is suitable for cavity gamma irradiators as well as beam type irradiators. The fully guarded chamber is mounted at the end of a 3 meter, low-noise triax cable.

20X6-0.6

High Dose Rate Chamber

This high dose rate chamber provides an excellent response at therapy and other high energy, high dose rate applications. The fully guarded chamber is mounted at the end of a 12 m low noise triax cable.

20X6-0.6CT

Modern Wide Beam Multi-Slice CT Chamber

0.6cc thimble chamber as described in the AAPM Report No. 111 “Comprehensive Methodology for the Evaluation of Radiation Dose in X-ray Computed Tomography.” Ideal for dose measurements in modern wide beam multi-slice CT. Calibrated using X-rays @ 150 kVp, Phantom adapter included.

SPECIFICATIONS / TECHNICAL DATA: All specifications subject to change.

CHAMBERS	20X6-6		20X6-6M		20X6-60/60E		20X6-3CT *		20X6-180		20X6-1800		20X6-0.6/0.6CT		20X6-0.18	
Minimum Rate	1 mR/min	0.2 µGy/s	1 mR/min	0.2 µGy/s	0.1 mR/min	0.02 µGy/s	1 mR/min	0.2 µGy/s	1 mR/hr	0.01 mGy/hr	0.1 mR/hr	1 µGy/hr	0.01 R/min	2 µGy/s	0.02 R/min	3 µGy/s
Maximum Rate	1 kR/min	150 mGy/s	1 kR/min	150 mGy/s	100 R/min	15 mGy/s	1 kR/min	150 mGy/s	1 kR/hr	8.8 Gy/hr	65 R/hr	570 mGy/hr	10 kR/min	1.5 Gy/s	10 kR/min	1.5 Gy/s
Minimum Dose	0.03 mR	0.3 µGy	0.03 mR	0.3 µGy	3 µR	0.03 µGy	0.03 mR	0.3 µGy	1 µR	5 nGy	0.1 µR	0.5 nGy	0.3 mR	3 µGy	1 mR	5 µGy
Maximum Dose	144 kR	1.2 kGy	144 kR	1.2 kGy	14 kR	120 Gy	144 kR	1.2 kGy	2.4 kR	21 Gy	240 R	2.1 Gy	1.4 MR	12 kGy	2.4 MR	21 kGy
Calibration Accuracy	±4% using X-rays @ 150 kVp & 10.2 mm Al HVL		±4% using X-rays @ 30kVp and 0.50 mm AL HVL		**-60** ±4% using X-rays @ 150kVp and 10.2 mm AL HVL	**-60E** ±4% using X-rays @ 50kVp and 0.88 mm AL HVL	±4% using X-rays @ 150 kVp and 10.2 mm Al HVL		±4% using X-rays @ 150 kVp & 10.2 mm Al HVL		±4% using X-rays @ 150 kVp & 10.2 mm Al HVL		**0.6** ±4% using $_{60}$Co	**0.6CT** ±4% using x-rays @ 150 kVp and 10.2mm Al HVL	±4% using $_{60}$Co	
Exposure Rate Dependance	±5%, 2 mR/min to 1000 R/min, up to 500R/s for 10 ms pulses		±5%, 2 mR/min to 1000 R/min		±5%, 2 mR/min to 199 R/min		±2%, 2 mR/s to 40 R/s		±5%, 20 mR/hr to 2000 R/hr		+0%, -5%, 0.1 mR/hr to 20R/hr, -10% to 65 R/hr		±5%, 0.6 R/min to 6 kR/min		±2%, 10 R/hr to 650 kR/hr	
Energy Dependance	±5%, 30 keV to 1.33 MeV (with build-up material)		±5%, 10 keV to 40 keV		**-60** ±5% 20 keV to 1.33 MeV (with build-up material)	**-60E** ±5% 0.2 mm Al HVL to 1.33 MeV (with build-up material)	±5%, 3 - 20 mm Al HVL		±5%, 33 keV to 1.33 MeV (with build-up material)		±5%, 33 keV to 1.33 MeV		**0.6** ±5%, 40 keV to 1.33 MeV (with build-up cap)	**0.6CT** ±5% 3 to 20 mm Al HVL	±5%, 45 keV to 1.33 MeV	
Construction	Polycarbonate walls and electrode conductive graphite interior coating; 6 cm^3 active volume; 0.3 kg		0.7 mg/cm^2 metalized polyester window; polyacetal exterior; 6 cm^3 active volume; 0.32 kg		Polycarbonate walls; conductive graphite exterior coating; 60 cm^3 active volume, 3 m low-noise triax cable; 0.32 kg		C552 air-equivalent walls and electrode; polyacetal exterior cap; 3 cm^3 active volume; 2 m, low-noise triax cable; 0.3 kg		Polycarbonate walls and electrode; conductive graphite exterior coating; 180 cm^3 active volume; 0.35 kg		Polycarbonate walls and electrode; conductive graphite exterior coating; 1800 cm^3 active volume; 0.88 kg		C552 air-equivalent material & electrode; polyacetal exterior cap; 0.6 cm^3 active volume; **0.6** 12 m triax cable **0.6CT** 3 m triax cable		C552 air-equivalent walls & electrode; polyacetal exterior cap; 0.18 cm^3 active volume; 3 m, low-noise triax cable; 0.3 kg	

Calibration Accuracy ± 4 %, Energy Dependence ± 5 %. Plug-and-play.

* **Uniformity Along Length & Partial Volume Exposure** ±5%, to within 0.25 cm of chamber ends for a constant volume slice. Active length of 10 cm.