

### 10X5-6

#### General Purpose In Beam Chamber

The 10X5-6 chamber permits in-beam measurements as described in "Routine Compliance Testing for Diagnostic X-ray systems" (PB89-205215). This chamber is ideal when using the CDRH geometry (the 10T5 test stand).



### 10X5-180

#### Leakage And Low Level Measurements Chamber

The 10X5-180 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<sup>2</sup>.



### 10X5-6M

#### 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 and makes corrections unnecessary. Unlike solid state detectors, the -6M's response is not influenced by tube target material or filtration.



### 10X5-1800

#### Radiation Protection Chamber

The 10X5-1800 ionization chamber is intended for low-level radiation measurements such as shielding leakage, irradiator and environmental. Unlike typical survey meters, the 10X5-1800 chamber offers improved accuracy over a wider dynamic range.



### 10X5-60/60E

#### Service and Image Intensifier Chamber

The dynamic range and thin profile of these chambers make them ideal for virtually all X-ray service applications

- Input Dose at the Image Intensifier
- High dose rates encountered in Fluoroscopy
- Cine, spot film devices & other special procedures



### 10X5-0.18

#### High Dose Rate Chamber

The 10X5-0.18 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.



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.

### 10X5-0.6

#### 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.



### 10X5-3CT

#### 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 10x5-3CT 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.



### 10X5-0.6CT

#### 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.



for use with: 9010 - 9015 (1015 - 1515 not pictured)



### SPECIFICATIONS / TECHNICAL DATA:

All specifications subject to change.

| CHAMBERS                        | 10X5-6  | 10X5-6M  | 10X5-60/60E  | 10X5-3CT *   | 10X5-180  | 10X5-1800  | 10X5-0.18  | 10X5-0.6/0.6CT  |
|---------------------------------|---|--|--|--|---|--|--|---|
| <b>Minimum Rate</b>             | 0.1 mR/min 0.1 µGy/min  | 0.1 mR/min 0.1 µGy/min   | 0.01 mR/min 0.01 µGy/min   | 0.1 mR/min 1 µGy/min   | 0.1 mR/hr 1 µGy/hr  | 0.01 mR/hr 0.1 µGy/hr  | 0.1 R/hr 1 mGy/hr  | 1 mR/min 1 µGy/min  |
| <b>Maximum Rate</b>             | 840 R/min 7.4 Gy/min  | 840 R/min 7.4 Gy/min   | 80 R/min 730 mGy/min   | 1.7 kR/min 15 Gy/min   | 1.7 kR/hr 15 Gy/hr  | 65 R/hr 575 mGy/hr   | 650 kR/hr 5.7 kGy/hr   | 8 kR/min 74 Gy/min  |
| <b>Minimum Dose</b>             | 1 µR 0.01 µGy   | 1 µR 0.01 µGy  | 0.1 µR 1 nGy   | 1 µR 0.01 µGy  | 0.01 µR 0.1 nGy   | 1 nR 0.01 nGy  | 0.01 mR 0.1 µGy  | 0.01 mR 0.1 µGy   |
| <b>Maximum Dose</b>             | 70 kR 600 Gy  | 70 kR 600 Gy   | 7 kR 60 Gy   | 140 kR 1.2 kGy   | 2.3 kR 20 Gy  | 230 R 2 Gy   | 2.3 MR 20 kGy  | 700 kR 6 kGy  |
| <b>Cine Specifications</b>      | 0.1 µR/f - >1R/f<br>1 nGy/f - >10 mGy/f   | N/A  | 0.01 µR/f - >100 mR/f<br>0.1 nGy/f - >1.0 mGy/f  | N/A  | N/A   | N/A  | N/A  | N/A   |
| <b>Calibration Accuracy</b>     | ±4% using X-rays @ 60 kVp & 2.8 mm Al HVL   | ±4% using X-rays @ 20 kVp & 0.26 mm Al HVL   | <b>-60</b> ±4% using X-rays @ 150kVp and 10.2 mm AL HVL<br><b>-60E</b> ±4% using X-rays @ 50kVp and 0.88 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   | ±4% using X-rays @ 150 kVp & 10.2 mm Al HVL  | ±4% using <sup>60</sup> Co   | <b>0.6</b> ±4% @ <sup>60</sup> Co<br><b>0.6CT</b> ±4% using X-rays @ 150 kVp and 10.2mm Al HVL  |
| <b>Exposure Rate Dependence</b> | ±5%, 2 mR/min to 1000 R/min, up to 500 R/s for 10 ms pulses   | ±5%, 2 mR/min to 600 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 20 R/hr, -10% to 65 R/hr  | ±2%, 10 R/hr to 650 kR/hr  | ±2%, 10 mR/s to 100 R/s   |
| <b>Energy Dependence</b>        | ±5%, 30 keV to 1.33 MeV (with build-up material)  | ±5%, 10 keV to 40 keV  | <b>-60</b> ±5% 20 keV to 1.33 MeV (with build-up material)<br><b>-60E</b> ±5% 0.2 mm Al HVL to 1.33 MeV (with build-up material) | ±5%, 3mm Al to 20 mm Al HVL  | ±5%, 33 keV to 1.33 MeV (with build-up material)  | ±5%, 33 keV to 1.33 MeV (with build-up material)   | ±5%, 45 keV to 1.33 MeV  | <b>0.6</b> ±5%, 40 keV to 1.33 MeV (with build up cap)<br><b>0.6CT</b> ±5% 3 to 20 mm Al HVL  |
| <b>Construction</b>             | Polycarbonate walls and electrode; conductive graphite interior coating; 6 cm <sup>3</sup> active volume; 0.05 kg | 0.7 mg/cm <sup>2</sup> metalized polyester window; polyacetal exterior; 6 cm <sup>3</sup> active volume; 0.08 kg | Polycarbonate walls; conductive graphite exterior coating; 60 cm <sup>3</sup> active volume, 3 m low-noise triax cable; 0.13 kg  | C552 air-equivalent walls and electrode; polyacetal exterior cap; 3 cm <sup>3</sup> active volume; 2 m, low-noise triax cable; 0.11 kg | Polycarbonate walls and electrode; conductive graphite exterior coating; 180 cm <sup>3</sup> active volume; 0.11 kg | Polycarbonate walls and electrode; conductive graphite exterior coating; 1800 cm <sup>3</sup> active volume; 0.54 kg | C552 air-equivalent walls & electrode; polyacetal exterior cap; 0.18 cm <sup>3</sup> active volume; 3 m, low-noise triax cable; 0.1 kg | C552 air-equivalent material & electrode; polyacetal exterior cap, 0.6 cm <sup>3</sup> active volume, <b>0.6</b> 12m triax <b>0.6CT</b> 3m triax cable; 0.28 kg |

\* 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.