

Cylindrical Ion Chambers

Victoreen® Model 550T Series

- Cylindrical Ion Chambers for use with Model 35040 and Model 560 electrometers
- Wide range of applications in Diagnostic X-Ray and Radiation Oncology suites
- Accommodates energies from 21 keV to 12 MeV (with equilibrium cap)
- The 550 Series offers volumes of 330, 33, 3.3 and 0.33 cm³
- Chamber sensitivities are available for 100, 10, 1 and 0.1 nA/R/s
- These chambers accommodate rates of 0.03, 1.5, 10 or 2300 R/s
- Ion Collection Efficiency information is available for specific frequencies

Introduction

Model 550T Series Cylindrical Ionization Chambers are fully guarded thimble-type probes for use in a variety of applications. Equilibrium caps are available for each probe, extending their energy range up to 12 MeV. Sensitive volumes have been selected such that the nominal coulomb-to-roentgen calibration factors are convenient powers of ten. The cables may be terminated by triax BNC connectors for compatibility with Model 560, Model 35040 electrometers, or coax UHF connectors for compatibility with the older model electrometers.



Applications

The family of Cylindrical Ionization Chambers is designed to meet a wide range of radiation measurement and dosimetry applications required for diagnostic x-ray and radiation therapy in medical facilities. The 550T Series Ion Chambers offers volumes of 330, 33, 3.3, 0.33 cm³ for scatter, dose and rate measurements and accommodate energies from 21 keV to 12 MeV when used with equilibrium caps.

The selection guide on the next page will assist the user in selecting the appropriate chamber for rates from 0.03 to 2300 R/s and for sensitivities from 100 to 0.1 nA/R/s.

Equilibrium caps - specific energies

| | 550-3T | 550-4T | 550-5T | 550-6AT |
|--|-----------|-----------|-----------|------------|
| ¹³⁷ Cs, ⁶⁰ Co, 2 MeV | 550T-3-26 | 550T-4-26 | 550T-5-26 | 550T-6-25 |
| 4 MeV | 550T-3-27 | 550T-4-27 | 550T-5-27 | 550T-5-26* |
| 6 MeV | 550T-3-28 | 550T-4-28 | 550T-5-28 | 550T-5-27* |
| 8 MeV | 550T-3-29 | 550T-4-29 | 550T-5-29 | 550T-5-28* |
| 10 MeV | 550T-3-30 | 550T-4-30 | 550T-5-30 | 550T-5-29* |
| 12 MeV | 550T-3-31 | 550T-4-31 | 550T-5-31 | 550T-5-30* |

* Used in conjunction with 550-6-25.

For more information, receive our full product catalog, or order online, contact **Radiation Management Services** business of **Fluke Biomedical**: 440.248.9300 or www.flukebiomedical.com/rms.

Specifications are subject to change without notice.

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Specifications

| | 550-3T | 550-4T | 550-5T | 550-6AT |
|---|---|-------------------------|--|-------------------------|
| Applications | Scatter, Diagnostic Orthovoltage, Supervoltage | | 1 therapy, Orthovoltage Supervoltage, Diagnostic | |
| Volume | 330 cm ³ | 33 cm ³ | 3.3 cm ³ | 0.33 cm ³ |
| Energy response | ± 6%, 21 keV to 520 keV without build-up medium | | ± 3%, 42 keV to 520 keV without build-up medium | |
| Sensitivity | 100 nA/R/s | 10 nA/R/s | 1 nA/R/s | 0.1 nA/R/s |
| **Intensity limit @ 99.5% (Rate) | 0.03 R/s | 1.5 R/s | 10 R/s | 2300 R/s |
| Ion collection eff. (Pulse) | 0.3 mR @ 60Hz | 2 mR @ 400 Hz | 6 mR @ 1.3 kHz | 80 mR @ 17kHz |
| Wall material | Acrylic | Acrylic | Polystyrene | Polystyrene |
| Wall thickness (density thickness) | 166 mg/cm ² | 166 mg/cm ² | 133 mg/cm ² | 133 mg/cm ² |
| Chamber diameter | 55.9 mm | 28.2 mm | 15.5 mm | 7 mm |
| Cable length | 3 m | 3 m | 3 m | 7.5 m |
| Max. rep. rate | 60 Hz | 400 Hz | 1.25 kHz | 17 kHz |
| *Stem scatter-x-ray | 0.10% | 0.70% | 0.90% | 0.70% |
| *Stem scatter - ¹³⁷ Cs | 0.10% | 0.20% | 0.20% | 0.20% |
| Distance for 1.5% geometry error | 36 cm | 18 cm | 6 cm | 6 cm |
| Leakage | 4 x 10 ⁻¹⁵ A | 4 x 10 ⁻¹⁵ A | 4 x 10 ⁻¹⁵ A | 4 x 10 ⁻¹⁵ A |
| Cable termination: Triax BNC or Coax UHF. Specify when ordering. | | | | |
| * Stem Scatter is included in calibration. | | | | |
| ** Rates are calculated from chamber geometry. For measurements of rates equal to or greater than those in the above table, the chamber ion collection efficiency should be investigated. | | | | |