



Specifications

Measured Quantities:

kV: measured during first 300ms of exposure:kVp average, kVp effective, and kVp maximum
 Accuracy: Mo/Mo: 1kV
 W/Al: 2kV or 2%
 Range: tungsten anode tubes: 27-155kVp molybdenum anode tubes: 21-50kVp
 Time: measured during entire exposure; referenced to 90% rise/fall time
 Accuracy: within 2ms or 2%, whichever greater
 Range: 1ms to 10s
 Exposure: measured during entire exposure, kVp corrected
 Accuracy: ±5%
 Range: 10mR to 10R
 Fluoroscopic rate: measured over 1s intervals
 Accuracy: ±5%
 Range: 0.5R/min to 200R/min

Detectors:

kV: CsI/photodiode pair measures x-ray transmission through differential copper attenuator
 Time: computed from kV waveform stored in memory against quartz crystal time base
 Exposure: internal plane-parallel ionization chamber
 Chamber volume: 36cc
 Chamber window: ... 38mg/cm², 19cm² polycarbonate
 Calibration: referenced to a voltage divider and calibration exposure monitor during irradiation
 Display: 16 character dot-matrix LCD
 Controls: six rocker switches:
 On/Off - power
 Radio/Fluoro - select radiographic or fluoro
 High/Lo - select high or low detector sensitivity
 Roll/RST - roll through data or reset
 W/Al / Mo/Mo - select target/filter combination
 Exp/All - select exposure only or all measurements

Connectors:

Power - accepts 9VDC, 500mA
 Scope - coaxial BNC for real-time waveform
 RS-232 - DB9, configured as DCE
 Signal - coax BNC for input from external ion chamber
 Bias - banana jack for external chamber bias
 Power: 110VAC UL-listed wall-mount transformer, rechargeable internal battery, recharges when plugged in
 Dimensions: 22.9 x 21.6 x 7.6cm (9 x 8.5 x 3 in)
 Weight: 1.6 kg (3.5 lbs)

Accessories

3033cc mammography ion chamber
 6000-20010cc CT pencil-type ion chamber
 6000-532B400cc parallel-plate ion chamber for scatter
 4000-69 Carrying case
 4000EXLMicrosoft® Excel Add-In software

Model 4000M+ Non-invasive X-Ray Beam Analyzer

The Victoreen 4000M+ measures kVp, exposure, and time simultaneously and non-invasively. In addition to its ability to make accurate measurements on tungsten/aluminum tubes, it is also capable of performing kVp, dose and time measurements on molybdenum anode mammography tubes. An external ion chamber connector provides an interface to a variety of external ionization chambers.

Operation of the 4000M+ is simple and straightforward. The operator simply places the instrument, with the switches set appropriately, on the x-ray table and makes the exposure. The display automatically updates, sequentially displaying the measured values. The instrument resets automatically, being instantly ready to take another exposure. Measurement data can be transferred to a personal computer using Microsoft® Excel Add-In software.

Five user-selectable filter pairs ensure optimum accuracy over the entire diagnostic range, with minimum filtration dependence. Exposure measurements are made with an integral plane-parallel ionization chamber, located above the filter wheel. Exposure time is measured with quartz crystal accuracy.

Features:

- ▶ Simultaneously measures kVp, exposure and time
- ▶ Suitable for Radiographic, Fluoro, Mammo and Dental measurement modes
- ▶ All measurements made non-invasively
- ▶ Accepts external ion chambers
- ▶ PC Interface with optional Excel Add-In software
- ▶ Waveform output