

451B

Ion Chamber Survey Meter with Beta Slide



The 451B state-of-the-art ion chamber survey meter is a handheld battery operated unit designed for use in both rugged and normal environments. The 451B includes a sliding beta shield to serve as an equilibrium thickness for photon measurements and enables beta discrimination. The 451B auto-ranges and measures radiation rate and accumulated dose from various radiation sources (alpha, beta, x-ray, gamma). The ion chamber detector allows for a fast response time to radiation from leakage, scatter beams, and pinholes. Additionally, the low-noise chamber bias supply provides for fast background-settling time.

The digital display features an analog bar graph, 2.5 digit readout, low battery indicator, freeze (peak hold) mode indicator, and an automatic backlight function. User controls consist of an ON/OFF button and a MODE button. The case is constructed of lightweight, high strength materials and is sealed against moisture.

The RS-232 interface can be connected directly to a computer for use with the Excel add-in for Windows (451EXL), enhancing the functionality of the instrument. This software allows for data retrieval, user parameter selection and provides a virtual instrument display with audible and visual alarm indication.

FEATURES

- Measures skin dose (slide open) and deep dose (slide closed)
- High sensitivity measurement of rate and dose simultaneously
- Records peak rate using "Freeze Mode"
- Auto-ranging and auto-zeroing
- RS-232 communications interface with optional Windows-based Excel add-in for data logging
- Ergonomic, anti-fatigue handle with replaceable grip, wrist strap and tripod mount
- Programmable flashing LCD display
- Easily-accessible battery door (operated by two 9-volt alkaline batteries) on the outside of the bottom case
- Available with dose equivalent energy response (SI units)



SPECIFICATIONS

Radiation detected	Alpha Beta Gamma	>7.5 MeV > 100 keV > 7 keV
Operating ranges, response time	0 mR/h to 5 mR/h (8 sec), 0 mR/h to 50 mR/h (2.5 sec), 0 mR/h to 500 mR/h (2 sec), 0 R/h to 5 R/h (2 sec), 0 R/h to 50 R/h (2 sec)	
Accuracy	Within 10 % of readings between 10 % and 100 % of full scale indication on any range, exclusive of energy response	
Detector	Chamber (CC vol. air ionization) Chamber wall (phenolic) Chamber window (mylar) Beta slide	349 246 mg/cm ² 6.6 mg/cm ² 440 mg/cm ²
Automatic features	Auto-zeroing, auto-ranging, and auto-backlight	
Warm-up time	One minute.	
Display LCD analog/digital with backlight	Analog Digital	100 element bar graph 6.4 cm long. Bar graph is divided into 5 major segments, each labeled with the appropriate value for the range of the instrument 2.5 digit display is followed by a significant zero digit depending on the operating range of the instrument. The units of measurement are indicated on the display at all times. Digits are 6.4 mm (0.25 in) high. Low battery and freeze indicators are also provided on the display
Modes	Integrate mode Freeze mode	Operates continuously 30 seconds after the instrument has been turned on. Integration is performed even if the instrument is displaying in mR/h or R/h Will place a tick mark on the bar graph display to hold on the peak displayed value. The unit will continue to read and display current radiation values
Environmental	Temperature range Relative humidity Geotropism	-20 °C to 50 °C (-4 °F to 122 °F) 0 % to 100 % (at 140 °F) < 1%
Typical energy dependence	¹⁶ Nitrogen gamma rays are 110 % to 120 % of indicated readings as determined at the University of Lowell	
Power requirements	Two 9 V alkaline, 200 hours operation	
Dimensions (WxDxH)	4 in x 8 in x 6 in (10 cm x 20 cm x 15 cm)	
Weight	1.11 kg (2.5 lb)	

