

# 451P-DE-SI

## Pressurized $\mu\text{Sv}$ Ion Chamber Survey Meter

### Technical Data



The 451P state-of-the-art ion chamber survey meter is a handheld battery operated unit designed for use in both rugged and normal environments. Ideally suited for area monitoring to insure radiation worker safety, the 451P-DE-SI provides precise, mSv, measurements of Deep-Dose Equivalent (ambient dose equivalent,  $H^*(10)$ ) exposure as defined by the United States Nuclear Regulatory Commission and International Commission on Radiation Units & Measurements. The 451P auto-ranges and measures radiation rate and accumulated dose from various radiation sources (beta, x-ray and 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.

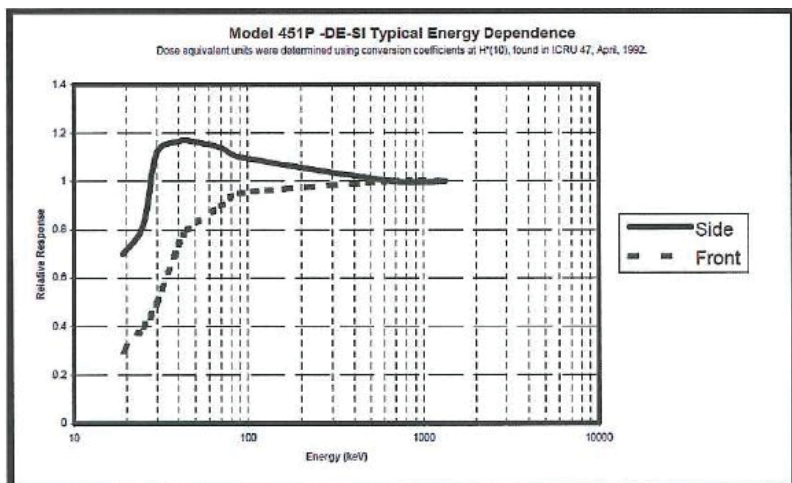
### Key features

- High  $\mu\text{Sv}$  sensitivity measurement of rate and dose simultaneously, with the capability to record peak rate
- 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



## Specifications

<b>Radiation detected</b>	Beta	> 1 MeV
	Gamma and x-rays	> 25 keV
<b>Operating ranges, response time</b>	0 to 5 µSv/h (5 sec) 0 to 50 µSv/h (2 sec) 0 to 500 µSv/h (1.8 sec) 0 to 5 mSv/h (1.8 sec) 0 to 50 mSv/h (1.8 sec)	
<b>Accuracy</b>	Within 10 % of readings between 10 % and 100 % of full scale indication on any range, exclusive of energy response (calibration source is <sup>137</sup> Cs)	
<b>Detector</b>	Chamber	230 CC Pressurized ionization chamber to 8 atmospheres (125 psi)
	Controls	ON/OFF and MODE
<b>Automatic features</b>	Auto-zeroing, auto-ranging, and auto-backlight	
<b>Warm-up time</b>	Less than one minute for initial operation when the instrument is in temperature equilibrium with the surrounding area, typical. (About four minutes for readings if less than 20 µR/h in a 10 µR/h or less background)	
<b>Display LCD analog/digital with backlight</b>	Analog	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
	Digital	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
<b>Modes</b>	Integrate mode	Operates continuously 30 seconds after the instrument has been turned on. Integration is performed even if the instrument is displaying in µSv/h or mSv/h
	Freeze mode	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
<b>Environmental</b>	Temperature range	-20 °C to 50 °C (-4 °F to 122 °F)
	Relative humidity	0 % to 100 % non-condensing
	Geotropism	Negligible
<b>Typical energy dependence</b>	<sup>16</sup> Nitrogen gamma rays are 110 % to 120 % of indicated readings as determined at the University of Lowell	
<b>Power requirements</b>	Two 9 V alkaline, 200 hours operation	
<b>Dimensions (WxDxH)</b>	10 cm x 20 cm x 15 cm (4 in x 8 in x 6 in)	
<b>Weight</b>	1.07 kg (2.4 lb)	



## Ordering Information

### Models

**451P-DE-SI-RYR** Pressurized  $\mu$ Sv Ion Chamber Survey Meter with dose equivalent chamber

### Optional accessories

**451EXL** 451 Assistant for Excel, includes RS-232 interface cable

**190HPS** Single Unit Carrying Case

**62-103** Check Source,  $^{137}\text{Cs}$ , 10  $\mu\text{Ci}$ . Flat disc, 1-inch diameter

\*\*Due to the pressurized ion chamber, the 451P is considered U.S. Department of Transportation (DOT) Dangerous Goods and must be shipped via IAW DOT special permit DOT-SP 13187.

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