

# 451P

## Pressurized $\mu$ R 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. The 451P is a pressurized ion chamber for  $\mu$ R resolution. The 451P has auto-ranging and measure radiation rate and accumulated dose from various radiation sources (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 digital readout, low battery, and freeze (peak hold) mode indicators, 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 (requires sound card) and visual alarm indication.

### Key features

- $\mu$ R resolution
- High 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 and audible alarm
- 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)

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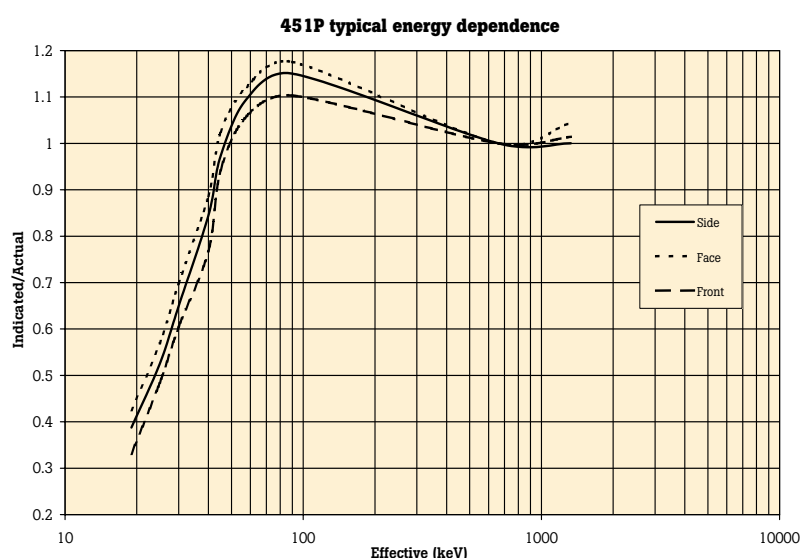
	<b>451P</b>
Detector	Pressurized ion chamber (125 psi)**
End users	<ul style="list-style-type: none"> <li>• x-ray manufacturers</li> <li>• state inspectors</li> <li>• government agencies</li> <li>• biomedical technicians</li> <li>• maintenance technicians for airport baggage scanners</li> </ul>
Radiation detected	gamma, x-ray

\*\*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.

## Specifications

<b>Radiation detected</b>	Alpha	> 7.5 MeV
	Beta	> 1 MeV
	Gamma	> 25 keV
<b>Operating ranges, response time</b>	0 µR/h to 500 µR/h (5 sec) 0 mR/h to 5 mR/h (2 sec) 0 mR/h to 50 mR/h (1.8 sec) 0 mR/h to 500 mR/h (1.8 sec) 0 R/h to 5 R/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	
<b>Detector</b>	Chamber (cc volume air ionization)	230 cc
	Controls	ON/OFF and MODE
	Chamber wall (phenolic)	246 mg/cm <sup>2</sup>
	Chamber window (mylar)	6.6 mg/cm <sup>2</sup>
	Beta slide	440 mg/cm <sup>2</sup>
<b>Automatic features</b>	Auto-zeroing, auto-ranging, and auto-backlight	
<b>Power requirements</b>	Two 9 V alkaline, 200 hours operation	
<b>Warm-up time</b>	Less than two minutes for initial operation when the instrument is in equilibrium with ambient temperature	
<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 mR/h or R/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	-4 °F to 122 °F
	Relative humidity	0 % to 100 %
	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>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-RYR** Pressurized µR Ion Chamber Survey Meter with standard chamber

**451P-DE-SI-RYR** Pressurized µR 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, <sup>137</sup>Cs, 10 µCi. Flat disc, 1-inch diameter

**450UCS** Check Source, <sup>238</sup>Uranium, 0.064 µCi, impregnated, 2 in x 2 in yellow card

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### Fluke Biomedical.

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