

# 451B / 451P

## Ion Chamber Survey Meter

### *Safety Sheet*

Go to [www.fluke.com](http://www.fluke.com) to register your product and find more information.

### ***Safety Information***

A **Warning** identifies conditions and procedures that are dangerous to the user.

#### **Warning**

To prevent possible electrical shock, fire, or personal injury:

- Read all safety information before you use the Product.
- Use the Product only as specified, or the protection supplied by the Product can be compromised.
- Remove the batteries if the Product is not used for an extended period of time, or if stored in temperatures above 50 °C. If the batteries are not removed, battery leakage can damage the Product.
- The battery door must be closed and locked before you operate the Product.
- Replace the batteries when the low battery indicator shows to prevent incorrect measurements.
- Comply with local and national safety codes. Use personal protective equipment.
- Carefully read all instructions.
- Do not touch voltages > 30 V ac rms, 42 V ac peak, or 60 V dc.
- Do not use the Product around explosive gas, vapor, or in damp or wet environments.
- Do not use and disable the Product if it is damaged.
- Do not use the Product if it operates incorrectly.
- Examine the case before you use the Product. Look for cracks or missing plastic.
- Use this Product indoors only.
- Remove accessories before the battery door is opened.

- **Use care in the handling and storage of the check source. The check source contains radioactive materials used for the verification of the Product operation.**
- **Each person who uses a product that senses and measures ionizing radiation must:**
  - **Be approved to do work where there is radiation.**
  - **Obey all applicable safety procedures and regulations.**
  - **Be approved to correctly interpret the indications on the product.**








**The user of this Product must read and strictly obey the instructions and precautions contained in the manuals. If you do not obey the instructions and precautions, there is a risk of injury. If you do not obey the instructions and precautions there is a risk that the Product will show incorrect indications. Before each use, do a battery check and other preoperational checks to make sure that the Product operates correctly.**

- **Do not put metal objects into connectors.**
- **Fluke recommends that you wait for a one-minute warm-up period before you make a measurement. If the unit experiences a very large temperature change (for example, it moves indoors from outside), a longer warm-up period can be necessary to measure a value less than 50  $\mu\text{R/h}$  (451P only).**
- **Do not operate the Product with covers removed or the case open. Hazardous voltage exposure is possible.**
- **Use care in handling this assembly during removal and installation. This Product contains lithium cells with a potential voltage of 63 V on the battery assembly.**
- **Use only specified replacement parts.**
- **Have an approved technician repair the Product.**
- **Only assemble and operate high-pressure systems if you know the correct safety procedures. High-pressure liquids and gases are hazardous and the energy from them can be released without warning (451P only).**
- **Use care when handling, the surface below the High Voltage Board is conductive!**
- **Many components on the printed circuit board are static sensitive. Obey all ESD precautions when you touch the printed circuit board assembly.**
- **Batteries contain hazardous chemicals that can cause burns or explode. If exposure to chemicals occurs, clean with water and get medical aid.**
- **Do not disassemble the battery.**
- **Repair the Product before use if the battery leaks.**

- **Be sure that the battery polarity is correct to prevent battery leakage.**
- **Do not short the battery terminals together.**
- **Do not disassemble or crush battery cells and battery packs.**
- **Do not keep cells or batteries in a container where the terminals can be shorted.**
- **Do not put battery cells and battery packs near heat or fire. Do not put in sunlight.**

**For safe operation and maintenance of the product, note the chamber bias from the self-test. If chamber bias is LO, the Product cannot measure high radiation rates accurately. The Product requires service, contact Fluke.**

## Symbols

Symbol	Description
	Hazardous voltage. Risk of electric shock.
	Risk of Danger. Important information. See Manual.
	DC (Direct Current)
	On/Off button
	This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9 "Monitoring and Control Instrumentation" product. Do not dispose of this product as unsorted municipal waste. Go to Fluke's website for recycling information.
	This product contains a Lithium-ion battery. Do not mix with solid waste stream. Spent batteries should be disposed of by a qualified recycler or hazardous materials handler per local regulations. Contact your authorized Fluke Service Center for recycling information.
	Conforms to European Union directives

# Specifications

## Environmental

Operating Temperature .....	-20 °C to 50 °C
Relative Humidity Range....	0 % to 95 % non-condensing
Geotropism.....	less than 1 %
Altitude .....	2000 m

## Power

Batteries .....	Two 9 volt batteries (NEDA 1604A or 6LR61 or 6AM6) Three lithium cells provide chamber bias voltage of 63 V (10 year life expectancy)
Battery Life .....	200 hours continuous operation.

## Warranty and Product Support

Fluke Biomedical warrants this instrument against defects in materials and workmanship for one full year from the date of original purchase. During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product, shipping prepaid, to Fluke Biomedical. This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by other than Fluke Biomedical. IN NO EVENT SHALL FLUKE BIOMEDICAL BE LIABLE FOR CONSEQUENTIAL DAMAGES.

Only serialized products and their accessory items (those products and items bearing a distinct serial number tag) are covered under this one-year warranty. PHYSICAL DAMAGE CAUSED BY MISUSE OR PHYSICAL ABUSE IS NOT COVERED UNDER THE WARRANTY. Items such as cables and nonserialized modules are not covered under this warranty.

Recalibration of instruments is not covered under the warranty.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state, province to province, or country to country. This warranty is limited to repairing the instrument to Fluke Biomedical's specifications.