FLUKE®
Biomedical

Nuclear Associates 05-575

MiniMonitor® III
Multipurpose X and Gamma Ray Survey Meter

Operators Manual

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Section 1
General Information

1.1 Description

The Minimonitor® III is used for detecting radiation levels from radioactive sources, radiation areas and x-ray machines with its internal GM tube (See Figure 1-1). Its optional external Pancake Probe is designed to detect Alpha, Beta and Gamma radioactive contaminations as low as 0.002 µCi (See Figure 1-2). A large area GM Pancake tube with a thin window permits direct contact measurements on surfaces as well as on hands, clothing, shoes, etc. Its wide energy response offers versatility for use in a multitude of radiological applications.

Lightweight and portable, the Minimonitor III operates on four standard "AA" cells. All controls are located on the face of the instrument. A flashing yellow LED will indicate changes in the field strength in proportion to the radiation level. In addition, it signals that the instrument is "ON". The indicator flashes for each detector pulse. A no-overload circuit assures indicator operation in radiation fields greater than 500 R/h when the detector ceases to operate in the pulse mode.

The Minimonitor III utilizes solid-state electronics with an F.E.T. amplifier for long-term stability. The electronics package also eliminates the necessity of individual range calibration.

A three-decade selector switch (0-10, 0-100, and 0-1000 mR/h) for the internal detector and (0-500, 0-5,000, 0-50,000 CPM) for the optional External Pancake Probe permits rapid changing of survey ranges.

CAUTION

This instrument is intended for the detection and measurement of ionizing radiation, it should be used only by persons who have been trained in the proper interpretation of its readings and the appropriate safety procedures to be followed in the presence of radiation. All instructions and warnings contained in this manual or on the instrument must be read before use and must be strictly followed. Failure to follow these instructions and warnings may result in inaccurate readings and/or user hazard. Battery and other operational checks must be performed prior to each use to assure that the instrument is functioning properly.

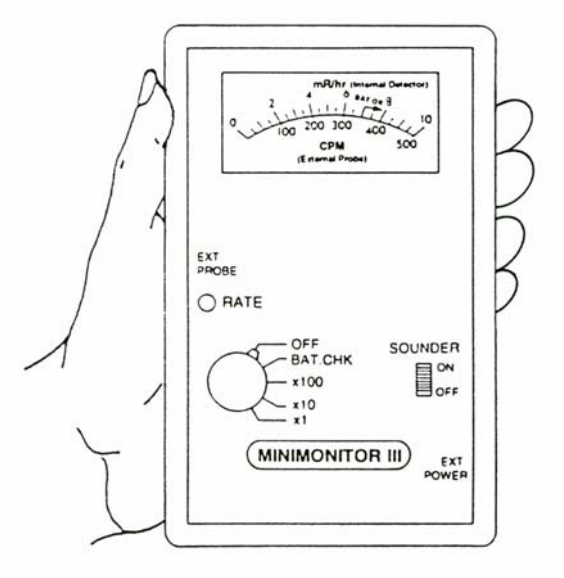

Figure 1-1. The MiniMonitor III

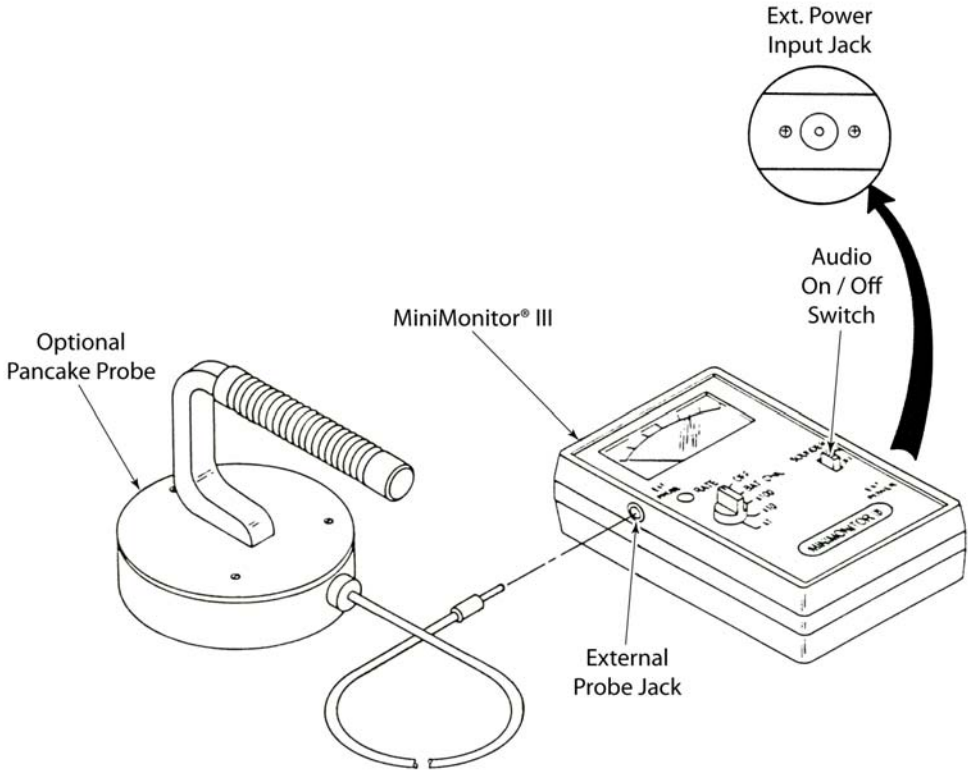

Figure 1-2. Pancake Probe Hook-up to MiniMonitor III

1.2 Internal GM Detector

Radiation Detected	Gamma and x-ray
Detector	Energy compensated GM tube
Ranges	0-10, 0-100, 0-1000 mR/h
Accuracy	± 10% of full scale when calibrated with ^{137}Cs
Energy Dependence	50 keV – 6 MeV, ± 30%
Operating Controls	OFF BAT CHK, x100, x10, x1 on one rotary switch indicator: Yellow LED (indicator) flashes once for each detector pulse. The Audio system will sound once for each detected pulse. Both will continue to function when detector ceases to operate in pulse mode (fields up to 500 R/h)
Time Constants	10 sec (x1), 2 sec (x10), 0.8 sec (x100)
Batteries	4 AA alkaline batteries (500 hour life)
Operating Temperature	-20° C to +55° C (-4° F to +130° F)
Readout	2 ½" Analog meter, marked 0-10 mR/h
Temperature Dependence	± 15% over noted temperature range
Construction	Solid-state electronics encased in a high impact plastic case
Overall Dimensions	5.50 in (H) x 3.50 in (W) x 1.63 in (D) (14 cm x 9.0 cm x 4.1 cm)
Weight	13 oz. (364 g)
Optional Accessories	10 µCi ^{137}Cs check source, 120 VAC adaptor, 5 VDC regulated output GM Pancake Probe (for specifications, see Section 1.2)

1.3 Optional GM Pancake Probe

Detector	GM Tube, thin window 1.5 to 2 mg/cm^2 window diameter 46.0 mm (1.812 in), window area 16.6 cm^2 (2.58 in^2) protective grille, 93% open
Readout	2 ½ in (6.4 cm) meter, 0 to 500 CPM
Range	0 to 500, 0 to 5,000, 0 to 50,000 CPM depending on range switch setting
Accuracy	± 10% of full scale
Operating Controls	Off, Battery Test, x100, x10, x1

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Section 2
Operation

2.1 Internal GM Detector

2.1.1 Checkout Procedure

Install 4 "AA" alkaline cells in MiniMonitor III. Check for proper battery voltage by turning the rotary switch to BAT CHK. With fresh batteries, the meter should read between 8 and 10. If the meter reads below 7.0, replace batteries with "AA" alkaline cells. All four should be replaced at the same time.

2.1.2 Range Selection

MiniMonitor III has three measurement ranges; 0-10, 0-100 and 0-1000 mR/h. Set the rotary switch to the appropriate range and place the instrument at the point of measurement to determine the radiation level. As noted in the specifications, the time constants vary with the range selected. Make sure the meter has reached equilibrium before taking a reading.

2.1.3 Electrical Adaptor

Plug power adaptor into opening in MiniMonitor III marked "EXT Power" and other end into a 120 V outlet. Verify that unit is functioning by using the "Battery Check".

2.2 External Pancake GM Detector

2.2.1 Preliminary Check

Check for proper battery operation of the Pancake GM Probe by turning the range switch to the BAT CHK position. If the batteries are new, the meter should read 450 to 500. When the reading goes below 350, replace the batteries with "AA" Alkaline cells.

2.2.2 Range Selection

MiniMonitor III has three constant measurement ranges; 0 to 500, 0 to 5,000 and 0 to 50,000 counts per minute. Set the range switch to the appropriate range (x1, x10, x100) to determine the radiation level. As noted in the 2.1 Specifications, the meter time constants vary with the range selected. Make sure that the meter has reached equilibrium before taking a reading.

2.3 Maintenance

The instrument should be turned off while it is not in use. Under normal usage, it will operate for about 500 hours before the battery replacement becomes necessary. To replace the batteries, remove the Battery Cover on the back of the case. This will expose the battery holder. Replace the batteries with new ones ensuring that the batteries are placed so that proper polarity is observed. After replacing the batteries, turn the knob to BAT CHK to make sure that the batteries are good and have been placed correctly. Replace the Battery Cover.

WARNING

This instrument contains CMOS integrated circuits. No service should be attempted unless the technician is thoroughly familiar with these devices. Static charges normally present in a dry atmosphere or leakage current in soldering irons or other non-grounded tools can instantly destroy CMOS integrated devices.

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