

SabreBPM™

Beta Particulate Monitor

Highlights

- Beta particulate in air detection
- Real-time alpha peak-shape-fitting for determining beta background compensation for radon—significantly reducing false alarms
- Complete instrument including internal pump weighs 8.3 lbs.
- 8-Hour battery life
- Performs both fast-responding (Acute) and high-sensitivity (Chronic) measurements
- Can be plumbed to house vacuum or external pump for higher flow rates and improved sensitivity
- Local Acute and Chronic dose, concentration, and flow logging as well as optional alpha spectrum logging
- Wireless 802.11g RadNet Output Option for remote monitoring
- MDC is less than 2×10^{-9} $\mu\text{Ci}/\text{cc}$ for Cs-137 using a 30 minute chronic analysis time in a 10 $\mu\text{R}/\text{h}$ gamma background
- American or SI units

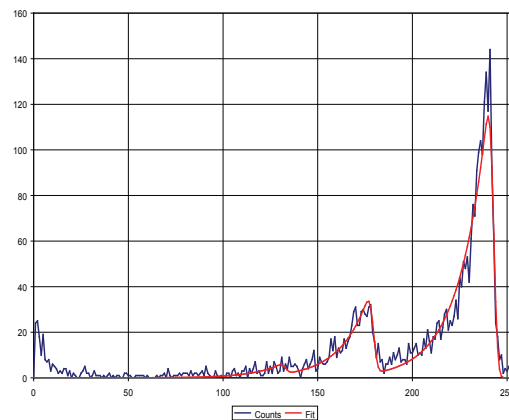
Description

The Bladewerx SabreBPM™ Beta Particulate Monitor is a lightweight, battery-powered, beta air monitor that can be used as a portable workplace monitor or a portable CAM for emergency-response assessments. It is designed to provide workers with an early warning of an airborne release of beta emitting particulates. Using the acclaimed Bladewerx peak-fitting software for radon-background subtraction means more accurate workplace measurement and alarm indications. A self-contained pump, built-in detector head, alarm light, sonalert and battery operation, allow the ultimate in beta air monitoring portability. A solid-state, ion-implanted, silicon detector and reliable 1024-channel multichannel analyzer provide the input for an embedded processor board that performs beta detection and the alpha spectral analysis for radon background compensation. An integrated 6-LPM pump, lithium-ion battery and charging electronics complete the package allowing battery operation of more than eight hours.



Background Peak-Shape-Fitting

State-of-the-art alpha peak shape fitting is used to quantify the beta counts from radon progeny. Alpha peak shape fitting is a technique that uses the profiles of multiple alpha isotope peaks to create a composite curve which best fits the actual alpha spectrum counts. Because the individual radon peaks are independently determined, the beta background compensation is impervious to radon equilibrium changes and contributes to a very low probability of false alarms.

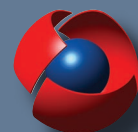


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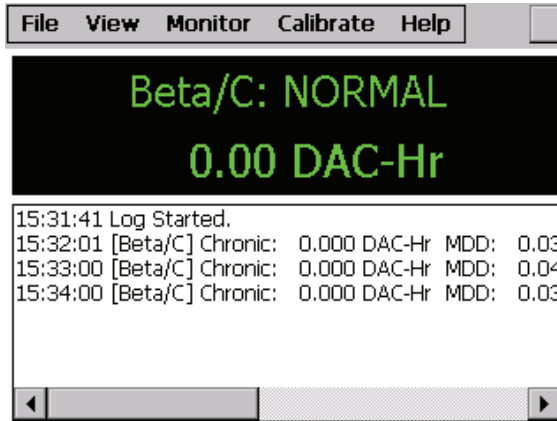
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Remote Monitoring

With the 802.11 WiFi wireless RadNet Output Option installed, multiple SabreBPMs report their status and readings to a wireless access point, up to 300 feet away, networked with a laptop or PC workstation running Bladewerx RadNet Client software, or other RadNet compliant client software. This capability allows remote supervisory monitoring, in real-time, of up to ten work areas or vehicles.

Local Display Features

An integrated LCD and touch screen displays detailed information on the instrument status and readings while in operation. The dose estimate and instrument status are prominently displayed at all times, while a window below either displays the historical readings and battery status, or displays the current alpha spectrum. The user may switch between the two displays from the View menu.

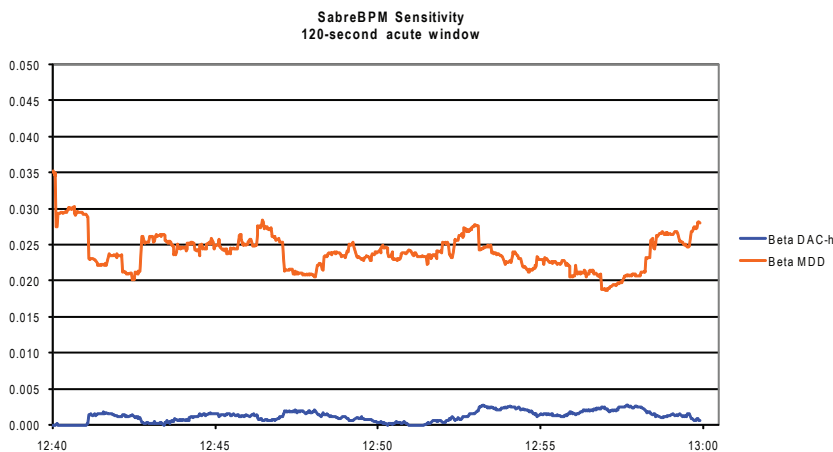


Data Logging

The SabreBPM™ creates log files of both the Acute (from 1- to 30-second detail) and Chronic (1- minute detail) readings, along with spectrum log files at a user-defined interval. These log files may be saved in the internal memory, or stored on a removable SD memory card, for later retrieval and review. The log files use the comma-separated-variable (*.csv) format, recognized by most spreadsheet and database software.

Sensitivity and Response Time

The sensitivity of the SabreBPM™ is dependent on several factors including, radon background, filter type, flow rate, acute and chronic window settings, and, of course, the energy of the isotope of interest. MDD is less than 0.03 DAC-h for ¹³⁷Cs using a 120 second acute analysis time in a 15 µR/h gamma background.



Optional Guard Detector

An optional internal guard detector is available, providing real time compensation for changing ambient gamma background levels.

Specifications

Sampling Head and Flow

- Detector: Solid-state ion-implanted silicon (450 mm² active area, 300 µm depletion)
- Pump: diaphragm-type, 6.0 LPM (typical)
- Filter: 37 mm SpecIon™ 1.5 µm PTFE membrane or compatible 37mm PTFE filter (25 mm collection area)

Data Analysis

- Single beta channel with upper/lower discriminator setting
- Alpha MCA: 1024-channel ADC binned to 256 channel alpha spectrum
- Radon plus fixed background subtraction
- Acute (120 sec. window) and Chronic (240 min. window) sensitivities, plus net count rate alarm
- Processor: Windows CE-based, 533 MHz Marvell X-Scale processor
- Max Count Rate: 600,000 cpm (beta + alpha)
- Source Response Check diagnostic
- Calibration: Electro-plated stainless steel sources required for efficiency calibration 37mm diameter with 25mm active area
- Alpha Energy Range: 1.0 - 9.0 MeV
- Beta Efficiency: 10-22% energy-dependant

Physical

- Battery powered: 8.4 V Li-Ion, 4.1Ah (8 Hr run-time, 4-hour charge time)
- Weight 8.3 lbs (3.8 kg)
- Dimensions: 13" w x 11" h x 5" d (33 x 28 x 13cm) with light stack lowered
- Temperature: 0 to 122 °F (-20 to 50°C)
- Humidity: 5 to 100% (non-condensing)
- Splash/dust-proof enclosure

Options

BIN-BPM-OPT1 Wireless RadNet Output
BIN-BPM-OPT2 SI Units
BIN-BPM-OPT4 Delete internal pump
BIN -BPM-OPT8 Guard Detector
BAC-RNCL-1 RadNet Client software
BPT-WAPG-1 802.11g wireless access point

Consumables

BSP-FILT-15B037 1.5 µm pore SpecIon filter

Spare Parts

BPT-LION-4100 4100 mA-h Li-Ion battery
BSP-PUMP-6L 6.0 LPM pump
BSP-SMCA-A1 SabreMCA board
BSP-ANNUN-A1 Annunciator board
BSP-BETA-A1 Beta counting board
BSP-PAMP-B1 Sabre beta preamp board
BPT-IFT4-ALT processor board (pre-config.)
BSP-CABL-1305 Pump/Battery cable
BPT-DETC-SD450-3 Detector, 450 mm²
BPT-ACADP-1222 AC adapter/charger (U.S.)
BPT-ACADP-1222AUS AC adapter/charger (AUS)
BPT-ACADP-1222UK AC adapter/charger (U.K.)