ALPHA AIR MONITORS

SabreAlert³™

Alpha Particulate Monitor

Highlights

- Weighs 5.9 lbs
- 10-Hour battery life
- Uses alpha peak-shape-fitting for individual measurements of nuclide counts–significantly reducing false alarms
- 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
- Acute and Chronic dose, concentration, and flow logging as well as spectrum logging
- Wireless 802.11b RadNet Output Option for remote monitoring
- Typical sensitivity of 1.0 DAC-h (Chronic) and 30 DAC-h (Acute) with less than one false alarm per 2080 hours of operation
- Radon Mode Option displays PAEC and also indicates radon progeny equilibrium
- American or SI units

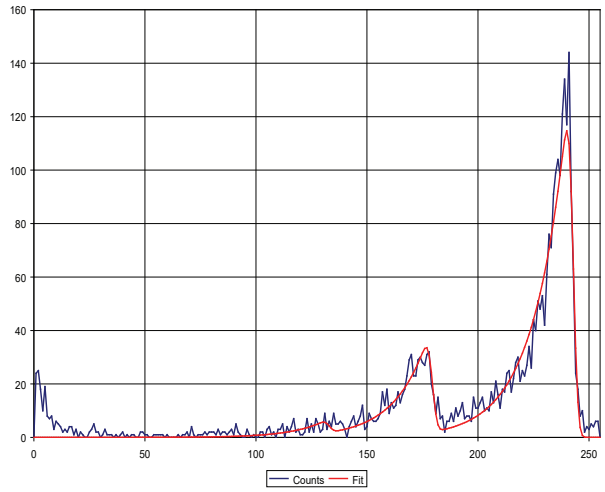
Description

The Bladewerx *SabreAlert³™* is a lightweight, battery-powered, alpha air monitor that can be used as a portable workplace monitor or a portable CAM for emergency-response assessments. Using the Bladewerx acclaimed 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 alpha air monitoring portability. A solid-state, ion-implanted, silicon detector and reliable 1024-channel multi-channel analyzer provide the input for an embedded processor board that performs the spectral analysis. An integrated 7-LPM pump, lithium-ion battery and charging electronics complete the package allowing battery operation of more than 10 hours.

The SabreAlert may be factory-configured for either the measurement of special nuclear materials (SNM), or for radon progeny measurements of potential alpha energy concentration (PAEC).

Alpha Peak-Shape-Fitting

State-of-the-art alpha peak shape fitting is used to separate the spectrum into the contributions from its constituent nuclides and quantify the spectrum counts from radon progeny and one or two user-defined isotopes-of-interest. 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 spectrum counts. Because the individual nuclide peaks are independently determined, the separation of nuclides is impervious to radon equilibrium changes and contributes to a very low probability of false alarms. Precise fitting of the ^{218}Po tail results in excellent sensitivity—superior, in many cases, to instruments sampling at 40 LPM.



Remote Monitoring

With the 802.11 WiFi wireless RadNet Output Option installed, multiple SabreAlerts 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

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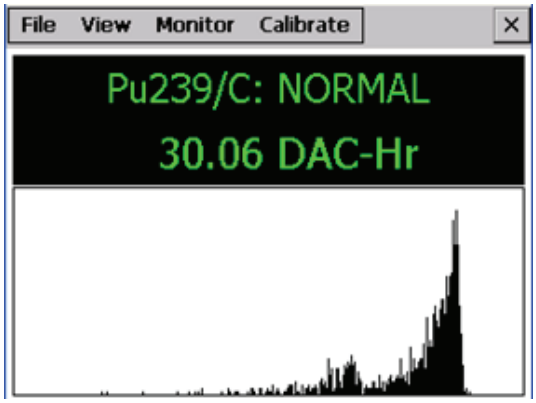
bladewerx™

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 of the isotope(s) of interest and instrument status are prominently displayed at all times, while a region below either displays the historical readings and battery status, or displays the current alpha energy spectrum.



Data Logging

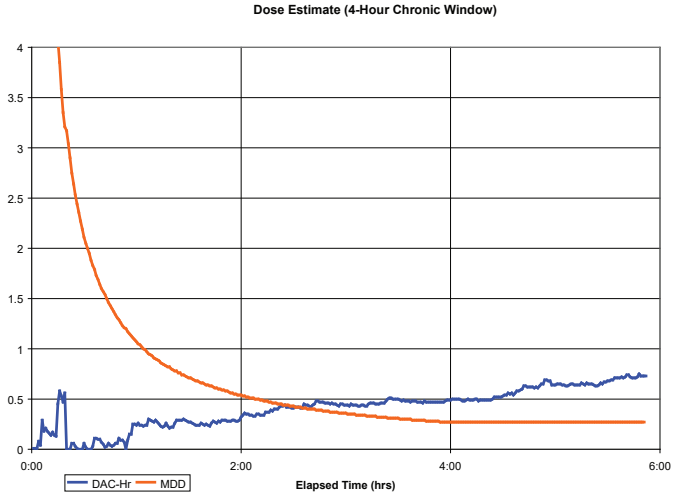
The SabreAlert creates log files of both the Acute (from 1- to 30-second detail) and Chronic (1-minute detail) readings, along with spectrum log files at a user-defined interval. These log files may be saved in the internal memory, or stored on a removable SD memory card, for later retrieval and review.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

Radon Mode Option

The SabreAlert may be factory-configured for a 'Radon Mode' where the instrument will monitor the potential-alpha-energy-concentration (PAEC) of airborne radon progeny. The display units can be configured for either American units of milli-Working Levels (mWL) and WL-h, or SI units of µJ/m^3 and µJ-h/m^3. Because the individual progeny concentrations are known, the effective (dis)equilibrium ratio of radon progeny can be determined and displayed. This feature can provide useful insights into the 'age' of the air sampled.

Sensitivity and Response Time

The sensitivity of the SabreAlert 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. The chart below illusrates typical MDD behavior for a window setting of 4-hours with a radon background of approximately 1.8 pCi/l.



Specifications

Sampling Head and Flow

- Detector: Solid-state ion-implanted silicon (450 mm^2 active area)
- Pump: diaphragm-type, 7.0 LPM (typical)
- Filter: 37 mm Speclon™ 1.5 µm PTFE membrane or compatible 37mm PTFE filter (25 mm collection area)

Data Analysis

- MCA: 1024-channel ADC binned to 256 channel spectrum
- Peak-fitting algorithm for ^{214}Po, ^{218}Po (Radon Mode also fits ^{212}Po and ^{210}Po) and two additional radionuclides (e.g. ^{239}Pu)
- Acute(120 sec window) and Chronic (240min)-sensitivities, plus net count rate alarm
- Processor: Windows CE-based PDA, 533 MHZ Intel X-Scale processor
- Max Count Rate: 600,000 cpm
- Source Response Check diagnostic
- Calibration: Electro-plated stainless steel source required for efficiency calibration. 37mm diameter with 25mm active area. ^{241}Am or ^{239}Pu recommended.
- Energy Range: 1.0 - 8.0 MeV (1.0 - 10 MeV in Radon Mode)

Physical

- Battery powered: 8.4 V Li-Ion, 6.3 Ah 10-hour run-time, 4-hour charge time
- Weight: 5.9 lbs (2.7 kg)
- Dimensions: 9"w x 9"h x 4"d (24 x 24 x 10cm)
- Temperature: 0 to 122 °F (-20 to 50°C)
- Humidity: 5 to 100% (non condensing)
- Splash/ dust-proof enclosures

Base Model

BIN-SABR-ALT3	SabreAlert^3, Alpha CAM

Options

BIN-ALT3-OPT1	Wireless RadNet Output
BIN-ALT3-OPT4	External Pump Configuration
BAC-RNCL-1	Rad Net Client software
BPT-WARPG-1	802.11g wireless access point

Consumables

BSP-FILT-15B037	1.5 um pore Speclon filter

Spare Parts

BPT-LION-6300	6300 mA-h Li-Ion battery
BSP-Pump-7L	7.0 L pump
BSP-SMCA-A1	SabreMCA board
BSP- SNNUN-A3.3	Annunciator board
BSP-PAMP-P2	Preamp Board
BSP-TDX-A1	TDX Processor Board
BPS-CABL-1305	Internal Cable, annun to pump/battery
BPT-DETC-SD450	Detector, 450mm^2
BPT-ACADP-1222	Ac adapter/ charger US
BPT-ACADP-NUS	Ac adapter/ charger non US

Data Sheet Revision: June 2019