

PLUTONIUM IN AIR MONITOR

FM-9MAB-PU SERIES

Models ~ FM-9MAB-PU ~ FM-9MAB-PU-M

FEATURES:

- BENCHTOP OR TRANSPORTABLE OPTIONS:
- **GROSS ALPHA**
- **GROSS BETA**
 - REJECTS RADON BACKGROUND
- PLUTONIUM
- URANIUM
- FM-9-MAB-PU-M (MOBILE - CART MOUNTED)
- RUGGED SOLID-STATE SILICON DETECTOR
- BETA GM PARTICULATE DETECTOR
- CONTINUOUS REAL TIME OPERATION
- REAL TIME ALARM - AUDIO / VISUAL, LOW FLOW ALARM
- INTERNAL DATA ARCHIVE & USB RETRIEVAL
- MCA – MULTICHANNEL ANALYZER
- USB PORTS (4) – COMPUTER INTERFACE
- RS232, ETHERNET, MODBUS/TCP
- PROVIDES LOCAL OR REMOTE SAMPLING
 - QUICK CHANGE FILTER
- **OPTIONS:**
 - MOVING FILTER HEAD – 1 YEAR UNATTENDED ON CART MOUNTED ONLY - FM-9MAB-PU-M
 - REMOTE ALARM – CELL PHONE ALERT
 - REMOTE READOUT
- **IP54**



**ELECTRONICS
FM-9MAB-PU SERIES**



**CART Mounted
2 Wheeled Vertical or
4 Wheeled Horizontal
FM-9MAB-PU-M SERIES**

APPLICATION:

The **FM-9MAB-PU** Series is an instrument for the detection of fissile material in research laboratories and in the field. The portability of the **FM-9MAB-PU-M** is designed for in the field use providing Homeland Security First Responders with a dynamic instrument for fissile material detection such as dirty bomb materials.

Technical Associates **FM-9 Air Monitor Series** assures safety against airborne radioactivity contamination by means of constant check with alarm and record capability. It provides integrated exposure information with an optional hard copy via external computer.

This Air Monitor Series is a complete system and may be expanded per need with modules of the **FM-9** series.

The **FM-9 Air Monitor Series** is **sensitive and versatile**.

It may be used to monitor stack effluent down to EPA levels as well as hoods, glove box or workplace air.



TECHNICAL ASSOCIATES

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DESCRIPTION:

- The **FM-9MAB-PU Air Monitors** utilize a solid-state detector and five coordinated single channel analyzer windows.
- These channel analyzers will reject Radon pulses.
- For example, the sample windows allow the user to preset specific energy levels (eg. The “Radium A” peak), measuring Pu-239 or other Alpha emitters in the presence of significant or changing **Radon-Thoron background**.
- This leak-free sampling system is designed with consideration of various particle sizes and collection efficiency.
- The count rates are shown on the front panel color monitor display both rate and integrated information.
- The **FM-9MAB-PU Air Monitors** utilize 3 detectors in addition to the primary Alpha solid-state detector (Total four detectors).
- The high-level alarm trip point is settable over the entire range.
 - ✓ When activated, the system provides an on-screen red alert and an audible alarm warnings.
 - ✓ An adjustable alarm delay prevents short term transient alarms.
- The system uses a quick change 47mm filter.
- The unit comes with an AP-3V air pump or may be plumbed to hood exhaust or in-house air system.
- Included with the **FM-9MAB-PU-Air Monitor Series:** Quiet Green Turtle Air Pump User’s Manual
Six feet plastic tubing or requested length A box of 100 Filters

SPECIFICATIONS FM-9MAB-PU-:

Detectors:

Four detectors

1. Primary solid state silicone Alpha particulate
2. Secondary solid state silicone Alpha particulate
3. GM Gamma detector for radon background
4. Gross Beta GM particulate detector

OPTIONAL DETECTORS:

1. Radon gas Ion Chamber
2. Iodine / Gamma with charcoal cartridge

Range:

Alpha: $10^{-2} - 10^5$ Bq/cm³ OR $10^{-1} - 10^6$ Bq/cm³ (Solid State).

Beta: $3 \times 10^{-1} - 10^5$ Bq/cm³

Sensitivity:

0.2 Bq/m³ at 180 liter/min air flow with hour reading.

Energy Response:

Resolution of 20-30 KeV

Alpha: 2.7-10MeV

Beta: 80 KeV – 2.5 MeV

Counting Efficiency:

24% of 2 pi with wide window setting for Pu-239 source in the filter holder.

Detector:

Solid state detector, cleanable silicon with a 490 sq. mm area and a typical Alpha resolution of 60 KeV maximum.

Response time:

2 sec. to 40 hours depending on required sensitivity.



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- Display:** 7" Color LCD monitor built-in user data display.
- **Concentration**
 - **Total Activity on Filter**
User Settable Units: (cps, Bq, μCi , Bq/m^3 , $\mu\text{Ci}/\text{l}$, DAC, DAC/h etc.)
 - **Raw Counts**
 - **Flow Status**
 - **Alarms – Detector:** Audio & Visual - User Settable.
Pump: See Below
 - **Overrange:** Between full scale range and 200% of the full-scale range - User settable
 - **Overload:** Counts are more than 200% of the full-scale range - User settable
 - **Self-Diagnostics:** Built-in
 - **System Failures:**
Detector Voltage: Audio / Visual, Message
Detector: Audio / Visual, Message
Microprocessor / microcontroller: Audio / Visual, Message
Failure indicators: Cleared automatically when normal resumed.
Pump: OFF / No flow indication
 - **Alert Change Filter:** Due to High Activity Build Up – Range Typically Set at 500 kBq or 13.5 μCi - User Settable.
 - **Torn Paper Filter Error Alert**

PUMP:

Pump: Quiet Green Turtle Pump – AP-3V included. 115V 60Hz 2Amps.
Optional: 220 V 50-60 Hz.

Flow Rate: 35 – 200 l/m (Normally set at 180 liters/min.) Accessible via Display

Mass Flow Meter: Real-Time air flow rate-data feeds directly into data analyzer software.

Onboard computer: Highest concentration accuracy eliminating need for manual adjustment of High and Low Flow Rates.

Alarm: Low flow; Failure, Accessible via Display

Ports: Sample In & Sample Out (1 each)
Purge Air Inlet (1)
Calibration (2) Ports

SAMPLING:

Filters: Pack of 100 47mm glass / HEPA filters included.

Efficiency: >97% - 0.3 micron particles

ENVIRONMENT:

Temperature Range: 20 to 130 degrees F. (-7 to 54 degrees C.)

Humidity: 90 % RH



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Housing: **Finish:** Baked enamel, easily cleaned.
Vapor-tight, rugged

IP-54

ELECTRONIC MODULES - PLUG IN TYPE:

MV-5.12.24: Electronics Power Supply – Accepts both 115V or 220V
MFT-5A: Sample Holder & Detector
SUB-5: Five level energy analyzer
MCA: Multichannel Analyzer
MAC-9: Air Control; Low Flow Alarm; Flowmeter
4-20A: Each channel
Data Output: RS232, Ethernet, MODBUS/TCP
FM-9: On Board computer with color monitor
Pump Power: 115V, 60 Hz (220 Volts, 50 Hz optional.)

WEIGHT & DIMENSIONS - ELECTRONICS / PUMP SYSTEM:

Electronics Only: : 20"W x 13"H x 18" D. (50.8 cm x 33 cm x 45.7 cm)
Excluding pump:
Weight: 35 lbs. (15.8 kg). excluding pump and detector
Pump Assembly: 8"W x 8"H x 14"D (20 cm x 20 cm x 35.5 cm) **Weight:** 14.4 lbs. (6.5 kg)

DESCRIPTION	FM-9MAB-PU SERIES FM-9MAB-PUM – Cart Mounted
Read-Out Units	User Settable
Measures	Airborne Concentration
Smart System	Calculations by On-Board Computer Easy On-Board Data Display & Archive Retrieval
Special Feature	Electronic Mass Flowmeter
Cart Includes	Vacuum Air pump, Air sampler, detector assembly, rotameters, electronics, MCA, <ul style="list-style-type: none">• Castor wheels with locks.• Vacuum pump located at the bottom• Two Electronic Mains: Pump, Display and Electronics



**QUIET OIL-LESS
GREEN TURTLE PUMP**



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FRONT PANEL ELECTRONICS	
CONTROLS & FUNCTIONS	AUDIO / VISUAL / MESSAGE INDICATORS
<ul style="list-style-type: none">➤ Master Power Switch For All Electronics.➤ Detector Bias Voltage, 50 Volts.➤ High Level Alarm Set.➤ Operate / Calibrate Modes.➤ Alarm Set, Displays Mode.➤ Alarm Acknowledge Button➤ Percent Subtract Function.➤ Threshold / Discriminator, Ten Turn-pot with 1,000 Division Dial.➤ Sample Window (PHA) Always Constant Above Threshold➤ Ten Turn Pot With 1,000 Division Dial.➤ Mode Switch - Gross Count, PHA, PHA-SUB.	<ul style="list-style-type: none">➤ On Screen High Alarm➤ Audio Alarm Warning➤ Loss of Signal On Screen➤ Running Time Record.➤ Mass Air Flowmeter➤ Low Air Flow Alert➤ ``Power On`` Light for Electronics➤ Overrange➤ Overload➤ Self-Diagnostics➤ Detector Voltage➤ Microprocessor / microcontroller:➤ Pump: OFF / No flow indication➤ Change Filter

SYSTEM OPTIONS:

- Remote Alarm
- Remote Display
- Cell Phone Alert
- Moving Filter Head – 1 Year Unattended

FEATURES Filter Head for FM-9MAB-PU Series

- Air Sampling Detector – Stainless Steel Housing
- Open Face Breathing Zone Operation For Room Air or Suitable Air Inlet Hose or Pipe



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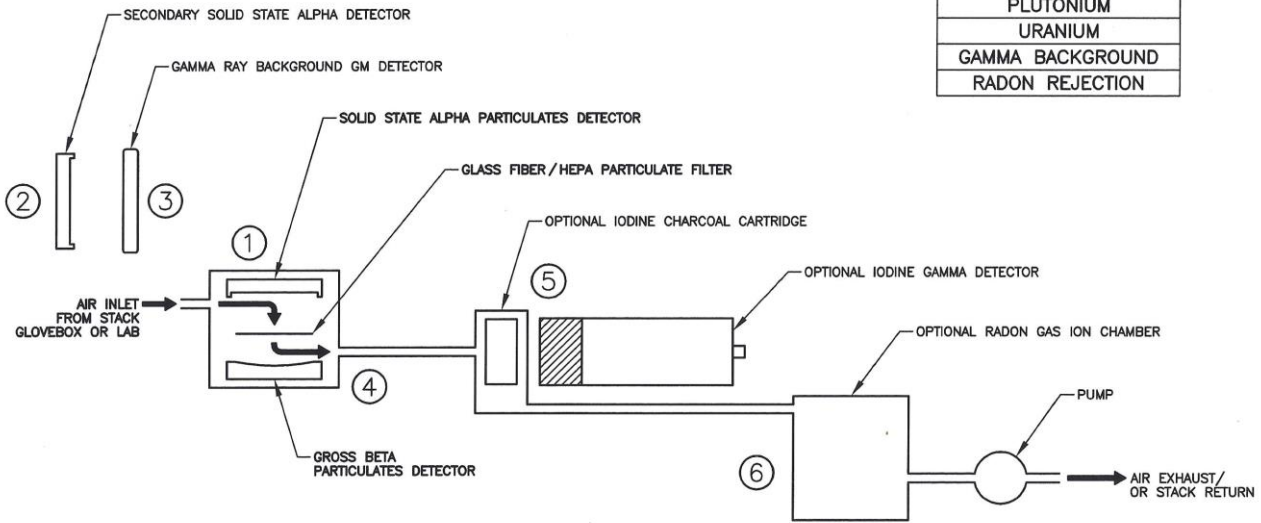
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PLUTONIUM IN AIR MONITOR



MEASURED :
GROSS ALPHA
GROSS BETA
PLUTONIUM
URANIUM
GAMMA BACKGROUND
RADON REJECTION

AIR - STACK MONITOR

FM-9MAB-PU FLOW CHART PLUTONIUM



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