

# BETA / GAMMA PARTICULATE AIR MONITOR

Model ~ FM-9-M2

## FEATURES:

- DETECTS BETA /GAMMA PARTICULATES
- DYNAMIC BACKGROUND SUBTRACT
- QUICK CHANGE FILTER
- REAL TIME CONTINUOUS OPERATION
- LOCAL OR REMOTE SAMPLING
- MODULAR ELECTRONICS DESIGN
- FOUR PI LEAD SHIELDING 1" - 2" THICK
- REAL-TIME AIR FLOW MEASUREMENT DISPLAY
- OIL-LESS GREEN TURTLE PUMP
- COMPUTER INTERFACE – USB OR ETHERNET
- DATA LOGGER – BUILT-IN



**FM-9-M2 SAMPLE  
HOLDER**

**Contains (2) 2" GM  
Pancake Tubes**



**FM-9-M2  
ELECTRONICS**

## APPLICATION:

The **FM-9-M2** Air Monitors assure safety against airborne radioactivity contamination by means of constant check with alarm and record capability. It provides integrated exposure information and has digital output available.

It is a complete system but may be expanded per need with modules of the **FM-9** series.

## DESCRIPTION:

The **FM-9-M2** is an all modular system and uses standard 47-55mm air filters held in unique quick-change holder.

- Two detector tubes are contained in a lead shielded chamber to collect & measure Beta / Gamma particulates in the air.
  - One detector measures the Beta / Gamma particulate contamination.
  - An identical second detector is used for background subtraction to correct the FM-9-M2 response for changes in ambient Gamma radiation.
- Air flow is supplied by the oil-less **Green Turtle Pump**.
- Real-Time air flow rate data from built-in mass flow meter feeds directly into data analyzer software and embedded processor for highest concentration accuracy.



Real - Time  
Air & Water  
Specialists



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- Alarms: Audible & visual alarm; high level alarm; low level alarm.
- The FM-9-M2 has an auxiliary provision to remote the alarm functions.
- Air is drawn through a three-foot inlet hose and exhausted via a flow meter through another three-foot hose. These may be extended to allow monitoring of hoods, glove boxes, stacks, etc...
- The unit is completely self-contained and is transportable.

## SPECIFICATIONS:

### ELECTRONICS:

<b>MV-5.12.24:</b>	Power Supply
<b>MAC-9:</b>	Air Control Timer; Low Flow Alarm Flowmeter
<b>FM-9:</b>	On Board computer with color monitor
<b>M<math>\mu</math>P:</b>	Imbedded processor

### Natural Background Response:

With Background subtract turned off, typically 25cpm with clean filter installed.

**Background Subtraction:** Compensates for approximately 90% of Gamma background.  
Typical background count at 0.02mR/hr is 2-4cpm.

**Ranges:** Four decades: 10-100,000cpm.

**Response Time:** Varies with count rate.

**Sensitivity:**  $1 \times 10^{-12}$   $\mu$ Ci/cc Sr<sup>90</sup>Y<sup>90</sup> after 4 hours, at 60 L/min.  
 $10^{-4}$   $\mu$ Ci per week (as Beta over 0.1MeV) integrated content of entire air amount drawn through system.

This corresponds to  $10^{-8}$   $\mu$ Ci/ml minute exposure which is better than 1% of California Safety Code Title 17 and NRC Title 10 limit for 40 hour exposure to most hazardous beta and/or gamma emitter in absence of Ac<sup>277</sup>.

**Counting Efficiency:** Approximate efficiency for 47mm diameter standard plated sources

- 25 percent of 2 Pi for Beta over 0.1MeV (including Tc<sup>99</sup>)
- 50% of 2 Pi for Sr<sup>90</sup>Y<sup>90</sup>.

**Display:** 7" Color LCD monitor built-in for digital and graphic user data display.

**Readout:** Direct Readout in concentration Bq/l or other units.

**Detectors:** Two each thin window 1 3/4" x 1.4mg/cm<sup>2</sup> pancake GM detectors Model T-1190.

**Shielding:** 1" - 2" lead shield, in all directions 4 Pi.

**Temperature Range:** 20 °F to 120°F (-7°C to 49°C) with less than  $\pm 20\%$  change in calibration and alarm point.

**Filters:** Includes package of 100 filters #41, 50mm.

**Power:** 115V, 60Hz (**Optional** 230V, 50Hz).



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## WEIGHT & DIMENSIONS:

<b>Dimensions:</b>	Electronics:	20" W x 13"H x 18" D.
	Detector assembly:	8"W x 15" H x 12" D.
	Pump assembly:	8"W x 8"H x 14"D.
<b>Weight:</b>	Electronics:	25 lbs
	Detector:	100 lbs
<b>Shipping Weight:</b>		140 lbs.

## SYSTEM OVERVIEW:

DESCRIPTION	FM-9-M2
Read-Out Units	Bq/l
<b>Optional</b> Read-Out Units	$\mu$ Ci/cc, KBq/l, etc.
Measures	Airborne Concentration
Smart System	Calculations by Imbedded Processor  On Board Data Logger
<b>Special Feature</b>	Electronic Mass Flowmeter



**Quiet, Oil-Less Green Turtle Pump  
Model ~ AP-3V**



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