

BETA PARTICULATE AIR MONITOR

Model ~ FM-9-M2

FEATURES:

- DETECTS BETA 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 particulates in the air.
 - One detector measures the Beta 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.



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Divisions of



US NUCLEAR CORP

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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:

MV-5.12.24:	Power Supply
MAC-9:	Air Control Timer; Low Flow Alarm Flowmeter
FM-9:	On Board computer with color monitor
MμP:	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: 1×10^{-12} μ Ci/cc Sr⁹⁰Y⁹⁰ after 4 hours, at 60 L/min.
 10^{-4} μ Ci per week (as Beta over 0.1MeV) integrated content of entire air amount drawn through system.

This corresponds to 10^{-8} μ 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 Ac²⁷⁷.

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

- 25 percent of 2 Pi for Beta over 0.1MeV (including Tc⁹⁹)
- 50% of 2 Pi for Sr⁹⁰Y⁹⁰.

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/cm² 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:

Dimensions:	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.
Weight:	Electronics:	25 lbs
	Detector:	100 lbs
Shipping Weight:		140 lbs.

SYSTEM OVERVIEW:

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



Oil-Less Green Turtle Pump



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