

BETA PARTICULATE AIR MONITOR MODEL # FM-7B, FM-7BX

FEATURES:

- 2" DIA PANCAKE GM **BETA** DETECTOR
- READS CONCENTRATION DIRECTLY IN Bq/M³, μCi/cc
- BOTH DIGITAL AND TREND DISPLAY
- **GAMMA** BACKGROUND SUBTRACTION
- REAL TIME ALARM
- PORTABLE
- LINE OPERATED
- INTEGRATED EXPOSURE
- STANDARD FM-7 MODULES
- CAN DRAW AIR FROM HOOD, DUCT, ETC.
- QUICK CHANGE FILTER HOLDER
- RS-232 COMPUTER INTERFACE
- FULL ETHERNET ACCESS (FM-7BX)



FM-7BX

APPLICATION:

The **FM-7B & FM-7BX** Beta particulate Air Monitor assures safety against airborne radioactivity contamination by means of constant check with alarm and record capability. It provides integrated exposure information and can provide hard copy via external printer or computer. It is a complete system but may be expanded per need with modules of the FM-7 series. The **FM-7B** is the **more sensitive and versatile version** of the broadly used long time standard, the **FM-5-AB2**. It may be used to monitor stack effluent down to EPA levels as well as hoods or workplace air.

DESCRIPTION: The **FM-7B** uses a standard filter in TA's unique quick-change, no-leak holder to trap any airborne radioactivity. The filter is under constant surveillance the beta pancake GM detector. Air is drawn by a regulated pump 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. Time is recorded by a type timer wired into the pump circuit. The unit is completely self-contained and portable. Complete with 100 filters.

SPECIFICATIONS:

- **Beta Sensitivity:** Limit of sensitivity (as Cs-137 at 30 liters/minute air flow rate) is 8×10^{-13} μCi/cc integrated over an 8 hour period, or 2×10^{-13} μCi/cc for a 40 hour period. This corresponds to 4×10^{-10} μCi/cc per minute of operation, which is equal to 1% of the California Safety Code Title 17 and USNRC Title 10 limit for 40 hour weekly exposure to most hazardous beta and/or gamma emitter in absence of Ac²²⁷.
- **Beta Detector:** 2" dia. T-1190 GM pancake detector with Beta window to eliminate alpha cross talk, or with 2mg/cm² window to allow C¹⁴ and S³⁵ detection.

Electronic Modules Includes:

- | | |
|-----------------|--|
| MVR-5R | Power and H.V. Bias Supply. |
| FIL-7DP | Programmable Scaler with Integrator and RS-232.
Computer Interface and Alarm. |
| MAC-5MFC | Air Control Timer; Low Flow Alarm and Mass Flowmeter/Control. |
| MGA-5202 | Single Channel Analyzer, High Voltage. |
| Micro | Micro-processor with optional 4.5" LCD trend display
Data Logger Accessible Archive – non volatile. |

TA TECHNICAL ASSOCIATES

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BETA PARTICULATE AIR MONITOR MODEL # FM-7B, FM-7BX

SPECIFICATIONS: (Continued)

- Pump:** Constant flow pump system & muffler & trap included. 115/230VAC 60, 0.6A System can also work from users vacuum system.
- Shielding:** 1/2" lead about sample and detector.
- Beta Range:** 1×10^{-13} to $1 \times 10^{-7} \mu \text{ Ci/cc}$ or (Ci/m^3) . Displays as Bq/M^3
- Radiation Alarms:** Settable. 2000 Hz beeper and red flasher.
Four concentration doserate alarms.
Beta Alert, Beta High
Alarms can also be set for activity on cartridge, integrated dose.
- Response Time:** Adjustable 1 second to 24 hours.
- Power:** 110/220 VAC, 50-60 Hz Single Phase.
- Flow Rate:** Regulated. Normally set at 30 liters/min. or up to 60Lpm.
- Filters:** Accepts 47 or 50 mm filters. Includes package of 100 glass fiber filters.
- Trapping Efficiency:** 99% trapping efficiency.
- Environmental:** Temperature: 0°C to 45°C. Humidity: 0-95% RH/non condensing.
- Case:** Electronics housed in enameled aluminum carrying case; handles included or may be rack mounted.
- Dimensions:** Excluding pump and detector assembly: 21"W x 13"H x 15" D.
Detector assembly 5"W x 10"H x 6" D.
Pump assembly 8"W x 8"H x 14"D.
- Accessories:** Filter: Free flowing high retention filter paper.
- System Weight:** 57lbs. (26kg)
- Shipping Weight:** 84lbs.
- Flow Meter:** Real-time mass flow control meters gives input to analyzer for accurate calculation of concentration Bq/m^3 .
- Status Lamps:** Status lamps and user relays show system status – high alarm, detection fault, pump fault, system normal monitoring.
- Gamma Background Subtraction:** Continuously compensated and updated.
- Display Units:**

Activity on Filter	– Bq, CPM, CPS, nCi
Integrated Activity	– Bq-hr/m^3 , DAC-hr.
Airborne Concentration	– Bq/m^3 , DAC.
- Local Data Display:** Real Time Back-light display plus optional Self Luminous LCD Monitor Display Numeric Airborne Concentration and optional Graphical Trend Display
- Data Record:** All data is recorded to accessible non volatile memory archive every 2 minutes for the **full year** including alarms and user response. No loss of archived data even in power failure event.
- Self Test Functions and Failure Alarms :** **FM-7B** runs thru a series of self-test and initialization and Radiation checks. Upon power turn-on and at daily intervals .
Throughout each day **FM-7B** performs various self tests including detector/bias voltage failure, low-flow, overloaded cartridge test.
Self tests can be set to readout as warnings or as alarms
User inserted calibration sources are provided.
- Semi-automated Calibration (optional):** User follows displayed messages to insert sources.
Enter sources strength on **keypad** so **FM-7B** can automatically perform its system recalibration.

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**BETA PARTICULATE AIR MONITOR
MODEL # FM-7B, FM-7BX**

FM-7BX has all FM-7B features plus the following:

- Full ethernet access.
- 4.5" self luminous monitor to display trend data and various on-screen instructions and data.
- Larger memory/Data archive.
- Easier change between engineering unit such as DAC, nCi, Bqhr/m³
- Semi-automatic guided calibration procedure.
- ORO-Networking software.

DETECTORS	BETA
TYPE	T-1190 Pancake GM
Sub-type	Kapton Alpha Shield eliminates crosstalk
Diameter	2" – 50 mm
Active Area	1550 mm ²
Entrance Window	1.5 – 2 mg/cm ² Mica and 1 mil Kapton
Lower Limit of Detection	1 x 10 ⁻¹³ uCi/cc (or Ci/ M ³)
Crosstalk Factor	Alpha into Beta <0.0009
Humidity and Pressure Protection	Air tight Kapton membrane
Counting Efficiency	30%-2Pi, Sr-90/Y-90 or more
Gamma Detect & Compensation	Continuous measurement and compensation of background

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