

# ALPHA & BETA PARTICULATE AIR MONITOR

$\alpha$  &  $\beta$  粒子空气监测器

Model ~ FM-9-MA2 ~ Alpha ~ Model ~ FM-9-MAB2 ~ Alpha & Beta  
Model ~ FM-9-MAB2-M ~ Alpha & Beta (MOBILE)

## FEATURES: 特点

- TABLE TOP OR TRANSPORTABLE OPTIONS:  
可选台式/可移动式
- **FM-9-MA2** ~ ALPHA ONLY  
此型号只测  $\alpha$
- **FM-9-MAB2** ~ ALPHA & BETA  
此型号只测  $\alpha$  &  $\beta$
- **FM-9-MAB2-M** ~ MOBILE OPTION  
此型号为移动式
- RUGGED SOLID STATE SILICON DETECTOR  
结实固态硅探测器
- INTERNAL DATA ARCHIVE & USB RETRIEVAL  
内置数据存储& USB检索
- QUICK CHANGE FILTER  
快速更换过滤器
- REAL TIME OPERATION  
实时操作
- REAL TIME ALARM - AUDIO / VISUAL  
实时声/光报警
- LOW FLOW ALARM  
低流报警
- PROVIDES LOCAL OR REMOTE SAMPLING  
提供就地或远程采样
- **FM-9-MAB2-M**
  - MOVING FILTER HEAD – 1 YEAR UNATTENDED  
此型号配备移动过滤纸
  - CART  
小车
- USB PORTS (4)  
USB接口
- **OPTIONS:** 选项
  - REMOTE ALARM – CELL PHONE ALERT  
远程报警-手机提示
  - REMOTE READOUT  
远程读数显示
- IP32



ELECTRONICS  
FM9-M SERIES  
电子学部分



MFH-AB MOVING FILTER HEAD  
FM9-MAB2-M ONLY  
移动过滤纸



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**CART Mounted**  
**2 Wheeled Vertical or**  
**4 Wheeled Horizontal**  
**FM9-MAB2-M ONLY**  
2 轮/4 轮竖载或横载车载型

## APPLICATION: 应用

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.

TA公司FM-9空气监测器系列通过连续监测报警及记录功能针对气溶胶辐射进行安全防护，可通过外接打印机打印总辐射信息。此系统可用FM-9模块系列进行功能拓展。此系统灵敏、功能性强。

也可用作烟道流出物监测，可达到环保部门标准，也可用于排烟道、手套箱及工作场所空气监测

## DESCRIPTION: 描述

- The **FM-9-MA2** and **FM-9-MAB2 Air Monitors** utilize a solid state detector and two coordinated single channel analyzer windows.

型号**FM-9-MA2**和**FM-9-MAB2**空气监测器使用固态探测器及两个相关联的单道分析窗

- Utilizing two coordinated single channel analyzers the electronics will reject Radon pulses.

通过两个相关联的单道分析窗，电子学将抑制氡脉冲

- The sample window (PHA allows the user to preset specific energy level for sample (eg. The "Radium A" peak), measuring Pu-239 or other Alpha emitters in the presence of significant or changing **Radon-Thoron background**.

样品窗（脉冲高度分析窗）允许用户预设具体某个样品的能量值（如镭A峰值），并在氡-钍本底高或变化情况下测量钚-239或其它 $\alpha$ 发射体

- The count rate is shown on the front panel color monitor display both rate and integrated information.

计数率显示在前板彩色显示器中，包括计数率和总计数

- The user can select the operating modes: gross count, pulse height analyzing (PHA), or PHA with background subtract (PHA-SUB).

用户可选择运行模式：总计数，脉冲高度分析，或者扣除本底的脉冲高度分析



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- The high level alarm trip point is settable over the entire range.  
报警上限可在量程内任意设定
  - ✓ When activated, the system provides an on screen red alert and an audible alarm warning.  
激活后, 系统提供屏显红色报警及声音报警
  - ✓ An adjustable alarm delay prevents short term transient alarms.  
可调整的延迟报警设置可阻止短时瞬间报警
- The system uses a quick change 47mm filter.  
系统使用快速更换的47mm过滤网
- The unit comes with an AP-3V air pump or may be plumbed to hood exhaust or in-house air system.  
系统配置AP-3V气泵, 也可连接到排风罩或房间内排气系统。
- Included with the **FM-9-Air Monitor Series:** Quiet Green Turtle Air Pump                      User's Manual  
Six feet plastic tubing    A box of 100 Filters  
FM-9空气监测系列包括: 绿龟静音泵, 用户手册, 6英尺长塑料管, 1盒100只装过滤网

## SPECIFICATIONS:

## 规格

<b>Detectors:</b>	Alpha, Beta Particulate (1 Each) <b>OPTIONAL:</b> Tritium.
探测器:	$\alpha$ , $\beta$ 粒子, 可选氚
<b>Detection:</b>	1% of MPC of Pu-239 can be detected with average Radon-Thoron background.
探测:	在一般氡-钍本底情况下可测到Pu-239最大允许浓度的1%
<b>Range:</b>	<b>Alpha:</b> $10^{-2} - 10^5$ Bq/cm <sup>3</sup> OR $10^{-1} - 10^6$ Bq/cm <sup>3</sup> <b>Beta:</b> $3 \times 10^{-1} - 10^5$ Bq/cm <sup>3</sup>
范围:	
<b>Sensitivity:</b>	0.2 Bq/m <sup>3</sup> at 180 liter/min air flow with hour reading.
灵敏度:	流量为180L/min时0.2 Bq/m <sup>3</sup>
<b>Energy Response:</b>	<b>Alpha:</b> 2.7-10MeV <b>Beta:</b> 80 KeV – 2.5 MeV
能量响应:	
<b>Counting Efficiency:</b>	24% of 2 pi with wide window setting for Pu-239 source in the filter holder.
计数效率:	宽能量窗情况下过滤器上Pu-239 2 $\pi$ 角度为24%
<b>Detector:</b>	Solid state detector, cleanable silicon with a 490 sq. mm area and a typical Alpha resolution of 60 KeV maximum.
探测器:	固体探测器, 可清洗硅, 面积490sq.mm.
<b>Response time:</b>	1 sec. to 40 hours.
响应时间:	
<b>Readout:</b>	7" Color LCD monitor built-in user data display.
显示:	



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- **Concentration** 浓度
- **Total Activity on Filter** 过滤网上总活度  
**User Settable Units:** (cps, Bq, μCi, Bq/m<sup>3</sup>, μCi/l, DAC, DAC-hr etc.) 用户设定单位
- **Raw Counts** 原始计数
- **Flow Status** 流量状态
- **Alarms – Audio & Visual - User Settable.** 报警-声/光
- **System Status; System Error** 系统状态, 系统故障
- **Alert Change Filter Due to High Activity Build Up – Range Typically Set at 500 kBq or 13.5μCi**  
**User Settable.** 累计高活度更换滤网警告-典型设定在 500 kBq 或13.5μCi
- **Torn Paper Filter Error Alert** 过滤纸断裂警告
- **Air Flow Rate Accessible via Display** 流量

<b>Alarm:</b>	On screen red light alert; audible alarm
报警:	红灯/声音报警
<b>Pump:</b>	Quiet Green Turtle Pump – AP-3V included. 115V 60Hz 2Amps. Optional: 220 V 50-60 Hz.
泵:	绿龟泵-AP-3V, 115V 60Hz 2Amps或选择220 V 50-60 Hz.
<b>Flow Rate:</b>	35 – 200 l/m (Normally set at 180 liters/min.)
流量:	
<b>Mass Flow Meter:</b>	Real-Time air flow rate-data feeds directly into data analyzer software and Onboard computer for highest concentration accuracy eliminating need for manual adjustment of High and Low Flow Rates.
质量流量计:	实时流量直接反馈到数据分析师, 软件及机载电脑对浓度进行最精准分析, 无 需手动调整高/低流量。
<b>Ports:</b>	Sample In & Sample Out (1 each) 进/出样口各一个
接口:	Purge Air Inlet (1) 冲洗空气进口 1 个 Calibration (2) 标定 2 个
<b>Filters:</b>	Pack of 100 47mm filters included.
过滤器:	带100支装47mm 过滤器
<b>Temperature Range:</b>	20 to 130 degrees F. (-7 to 54 degrees C.) Total change in system gain is less than ± 5%
温度范围:	20-130F, 系统总变化小于± 5%
<b>Finish:</b>	Baked enamel, easily cleaned.
表面:	烤漆, 易清洗

## ELECTRONIC MODULES INCLUDE: 电子学模块包括:

<b>MV-5.12.24:</b>	Electronics Power Supply – Accepts both 120V or 220V 电子学电源
<b>MFT-5A:</b>	Sample Holder & Detector 样品架和探测器



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- SUB-5:** Three level energy analyzer  
 3个能量窗
- MAC-9:** Air Control; Low Flow Alarm; Flowmeter  
 空气控制, 低流报警, 流量计
- FM-9:** On Board computer with color monitor  
 机载电脑带彩显
- Pump Power:** 115V, 60 Hz (220 Volts, 50 Hz optional.)  
 泵电源

**WEIGHT & DIMENSIONS:** 重量和体积

**Weight:** 35 lbs. excluding pump  
 重量: 不含泵35磅

**Dimensions:** 尺寸

Electronics Assembly & Internal Detector: 电子学及内置探测器:  
 20"W x 13"H x 18" D.

Pump assembly: 8"W x 8"H x 14"D.  
 泵组件:

**OPTIONS:** 选择

- Remote Alarm**                      **Remote Readout**                      **Cell Phone Alert**  
 远程报警                                  远程显示                                  手机报警

**FM-9-MAB2-M: Cart Mounted – 2 Wheeled Vertical or 4 Wheeled Horizontal**

此型号为车载型-2轮竖装或4轮横装

DESCRIPTION 描述	FM-9-MA2 & FM-9-MAB2
Read-Out Units 读出单位	User Settable 用户设定
Measures 测量	Airborne Concentration 气溶胶浓度
Smart System 智能系统	Calculations by On Board Computer Easy On Board Data Display & Archive Retrieval 机载电脑计算, 数据显示与检索
Special Feature 特点	Electronic Mass Flowmeter 电子流量计

## Oil-Less Green Turtle Pump



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<b>CONTROLS &amp; FUNCTIONS</b> 控制与功能	<b>INDICATORS:</b> 指示
<ul style="list-style-type: none"> <li>➤ Master Power Switch For All Electronics. 所有电子学主电源开关</li> <li>➤ Detector Bias Voltage, 50 Volts. 探测器偏压50v</li> <li>➤ High Level Alarm Set. 上限报警设定</li> <li>➤ Operate / Calibrate Modes. 运行/标定模式</li> <li>➤ Alarm Set, Displays Mode. 报警设定, 显示模式</li> <li>➤ Alarm Acknowledge Button 报警确认开关</li> <li>➤ Percent Subtract Function. 百分比缩小功能</li> <li>➤ Threshold / Discriminator, Ten Turn-pot with 1,000 Division Dial. 阈值/识别仪, 10转电位计1,000刻度</li> <li>➤ Sample Window (PHA) Always Constant Above Threshold 样品窗设定在阈值以上</li> <li>➤ Ten Turn Pot With 1,000 Division Dial. 10转电位计带1000刻度</li> <li>➤ Mode Switch - Gross Count, PHA, PHA-SUB. 模式转换-总计数, 样品窗, 本底扣除后样品窗</li> </ul>	<ul style="list-style-type: none"> <li>➤ On Screen High Alarm 屏显上限报警</li> <li>➤ Audio Alarm Warning 声音报警</li> <li>➤ Loss of Signal On Screen 屏显信号丢失报警</li> <li>➤ Detector Fail Rate 探测器故障率</li> <li>➤ Running Time Record. 运行时间记录</li> <li>➤ Mass Air Flowmeter 流量计</li> <li>➤ Low Air Flow Alert 低流报警</li> <li>➤ ``Power On`` Light for Electronics 电子学“电源开”指示灯</li> </ul>



**Moving Filter Head for Alpha / Beta ~ FM9-MAB2-M ONLY**

## FEATURES 特点

- MOVING FILTER TAPE 移动过滤纸带
- AUTOMATIC ADVANCE 自动传送
- REMOTE AIR SAMPLING DETECTOR HEAD 远程空气采样探测
- OPEN FACE BREATHING ZONE OPERATION FOR ROOM AIR 开放式采样头用于室内空气呼吸区采样
- SEALED PLASTIC CASE WITH CARRYING HANDLE 带提手的屏蔽塑料箱
- CLEAR FRONT PANEL 透明前板

## DESCRIPTION: 描述

**FILTER TAPE:** 过滤带

- PARTICLE SIZE: >5.0 μ m TEFLON MEMBRANE FILTER  
粒子大小: >5.0 μ m 特氟龙膜过滤器



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- WIDTH: 1.25" 宽
- LENGTH: 1,200" (other lengths optional) 长度 (可选其它长度)
- STEP LENGTH: 1" 步长 1 寸

**OPERATION:** 运行:

- 1 YEAR 1 YEAR UNATTENDED USE – STEP EVERY 8 HRS  
连续使用 1 年-每 8 小时自动更换一节
- 1 MONTH 1 MONTH UNATTENDED USE – STEP EVERY 1 HR  
连续使用 1 个月-每 1 小时自动更换一节

**WEIGHT & DIMENSIONS:** 重量&尺寸

- SIZE : 5" X 10" X 7"
- WEIGHT: 5 LBS

**MODES OF OPERATION:**(User Specified) 操作模式

- **REMOTE START:** SINGLE SHOT  
远程启动: 单次启动

**TIMED OPERATION:** -- (PRESET TIME)

定时运行:

- SINGLE SHOT 单次启动
- AUTO REPEAT 自动循环

**FILTER HEAD OPTIONS:** 过滤器头选项

- FILTER ROLLS: LONGER, SHORTER 过滤纸长、短
- SNIFFER HOSE: HOOD, GLOVE-BOX, STACK OR OTHER LOCATION  
嗅探管: 排风罩, 手套箱, 烟道或其它位置
- MASS FLOW SENSOR: PRECISION HOTWIRE SENSOR OR SIMPLE ROTOMETER  
质量传感器: 精准的 热丝式传感器或简单的转子流量计

**POWER:** 电源

- DC: 115V OR 220V - TABLETOP MODEL
- BATTERY OPERATION: DC 或 电池
- SYSTEM MOUNTING: WALL MOUNT, CART OR SKID 系统安装: 壁装, 小车或底板安装

**SYSTEM OPTIONS:** 系统选项:

- **Remote Alarm** 远程报警
- **Remote Readout** 远程读数
- **Cell Phone Alert** 手机报警

**FM-9-MAB2-M:**

- **Cart Mounted – 2 Wheeled Vertical or 4 Wheeled Horizontal**  
此系统带小车, 两轮或四轮



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