

**AIR or STACK MONITOR**  
**空气或烟囱道监测器**  
**GAS, GROSS BETA-GAMMA PARTICULATE, AND IODINE**  
**气体, 总  $\beta$  -  $\gamma$  粒子和碘**  
**Optional Alpha, Tritium and C14**  
**可选购  $\alpha$  , 氚和 C14**  
**MODEL # CAM-33, CAM-33-4, CAM-33-6**

The **CAM-33** series are multi-channel air monitors for simultaneous measuring of gross beta / gamma particulates, and noble gas radioactivity, and iodine. Plus option of Alpha particulates, Tritium and Carbon-14.

**CAM-33** 系列是一款多通道空气监测器, 同时测量总  $\beta$  -  $\gamma$  粒子和惰性气体辐射和碘。可选  $\alpha$  粒子、氚和 C-14

Like all of the CAM-33 series, these are leak free continuous duty, high capacity, rugged skid or caster mounted systems. Electronics includes computer with 17" COLOR LCD Monitor.

像所有的 CAM-33 系列一样, 这些仪器防漏、可连续工作、高容量, 坚固的防滑或连铸安装系统。电子学包括计算机, 17"彩色 LCD 显示器

Electronics are plug-in modules allowing change or addition of function as needed and allowing rapid repair by substitution of modules in the field. The modular system is covered by T/A's unique exchange warranty, in addition to the full one-year warranty covering all T/A products.

电子学为插入式模块, 如果需要可改变或增加附加功能, 可通过替换模块已进行快速维修。除一整年含盖所有 T/A 产品保修外, 模块系统还在 T/A 包换范围内。

Shields are void free lead encased in welded steel and with stainless steel liners and other features for long, useful life.

铅屏无空洞焊接在钢管内, 不锈钢里衬, 及其它特点以保持有效寿命。

Filters are easily changed via quick disconnect, o-ring-sealed filter holder. Shield can be opened for filter change or cleaning with minimum effort. All shield connections and openings are sealed against air leaks.

通过快速断开 O 型密封滤网托架, 容易更换滤网。屏可以容易地被打开更换滤网和清理。所有铅屏连接和开口密封, 以防止空气泄漏。

The air moving system is based on a high capacity oil less air pump capable of delivering 120 lpm (4cfm) free air and including Real time flow rate measurement and data analysis. Resists corrosion and dust.

空气律动系统基于大容量无油气泵, 最大气体输送量为 120 lpm (4cfm), 包括实时流量测量和数据分析。抗腐蚀和尘土。

The entire system is mounted in a self-contained rugged wheeled cabinet and comes complete with all cabling, connectors, and software in place, setup, and ready to operate. The standard unit is operated from 115 V single phase, 60 Hz; 220V optional, 50 or 60 Hz. Stack monitor, room or duct monitor.

整个系统安装在一个坚固的一体机柜里, 带轮, 随机带所有缆线、连接器、软件, 安装到位准备使用。标准装置使用单相电 115, 60 Hz。可选购 220V, 50 或 60 Hz。烟囱道监测, 房间或管道监测器。



**TA**

**TECHNICAL ASSOCIATES**

7051 ETON AVENUE \* CANOGA PARK, CA 91303 TELEPHONE (818) 883-7043 \* FAX(818) 883-6103

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Specification 规格	CAM-33	CAM-33-4	CAM-33-6
Channels 管道	Three 3	Four 4	Six 6
Activity Detected 检测辐射	1.Beta-gamma particulate $\beta$ - $\gamma$ 粒子 2.Iodine 碘 3.Noble gas 惰性气体	1,2,3 plus, 4.Alpha particulate 1.2.3.项, 加 $\alpha$ 粒子	1-4 plus, 5. Tritium and 6.Carbon-14 包含 1-4 项, 5.氚 6.C-14

**STANDARD DETECTORS 标准探测器**

Activity Detected 检测辐射	Beta-gamma particulate $\beta$ - $\gamma$ 粒子	Iodine 碘	Noble gas 惰性气体
Filters 滤网	2" dia 直径 2"	2.5" dia x 1" thick 直径 2.5" x 1" 厚	One Liter Chamber 1 升电离室
Filter Type 滤网类型	Glass Fiber Filter 玻璃纤维滤网	TEDA Activated Charcoal Cartridge TEDA 活性炭滤芯	Stainless Steel Lined 不锈钢里衬
Collection Efficiency 收集效率	99% Efficiency at 0.3 micron particle size 0.3 微米粒子大小为 99%	60 KeV to 3 MeV (7 MeV optional) 60 KeV -3 MeV (7 MeV 可选)	60 KeV to 3 MeV (7 MeV optional) 60 KeV -3 MeV (7 MeV 可选)

**OPTIONAL DETECTORS 可选探测器**

Activity Detected 探测辐射	Alpha particulate $\alpha$ 粒子	Organic Carbon-14 有机碳-14	Tritium 氚
Filters 过滤器	2" dia 直径 2"	2.5" dia 直径 2.5"	Dual Ion Chamber 双电离室
Filter Type 滤器类型	Glass Fiber Filter 玻璃纤维	TEDA Activated Charcoal Disk TEDA 活性炭盘	Stainless Steel Lined 不锈钢里衬



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**SPECIFICATIONS FOR CAM-33 规格**

Detector Standar	1 each	Particulate Beta-Gamma: 2 inch diameter GM
	1 each	Iodine: 2 inch diameter NaI(TI) Model PGS-3LI (Spectroscopic Grade)
	2 each	Gas Standard Range: 2 inch diameter GM.

Detector: 1 each Particulate Beta-Gamma: 2 inch diameter GM.  
 探头: 一个,  $\beta$  -  $\gamma$  粒子, 2 英寸直径 GM 管  
 Standard: 1 each Iodine: 2 inch diameter NaI(TI) Model PGS-3LI (Spectroscopic Grade)  
 标准: 一个, 碘: 2 英寸直径 NaI(TI)型号 PGS-3LI (光谱级)  
 2 each Gas Standard Range: 2 inch diameter GM.  
 二个, 气体标准范围: 直径 2 英寸 GM 管

Detectors (Optional)	1 each 1 个	Alpha 2" dia- Kapton window GM $\alpha$ 直径 2"-Kapton 窗 GM 管
	1 each 1 个	C-14- organic 2" dia Window Mica GM C-14, 有机, 直径 2"窗, Mica GM 管
	1 each 1 个	C-14- 2" dia - CO <sub>2</sub> Dual Ion Chamber C-14-直径 2"-CO <sub>2</sub> -双电离室
	1 each 1 个	H-3 Dual Ion Chamber H-3, 双电离室

Shielding: 屏蔽:	3" Lead; 4pi. Plus 1 to 3 inch lead placed between adjacent detectors 3"铅屏, 4pi.加相邻探探头建 1-3 英寸铅屏。
Detector Sensitivity: 探头灵敏度	Monitor is more sensitive on all channels by factors of 5 to 500 than is required by USNRC and other Regulatory Agencies 所有通道监测灵敏度比 USNRC 和其它监管机构高出 5 到 500 倍
Calibration: 校正:	Follow on-screen instructions for user-assisted automatic calibration. 按照屏幕上的说明, 用户辅助自动校正。



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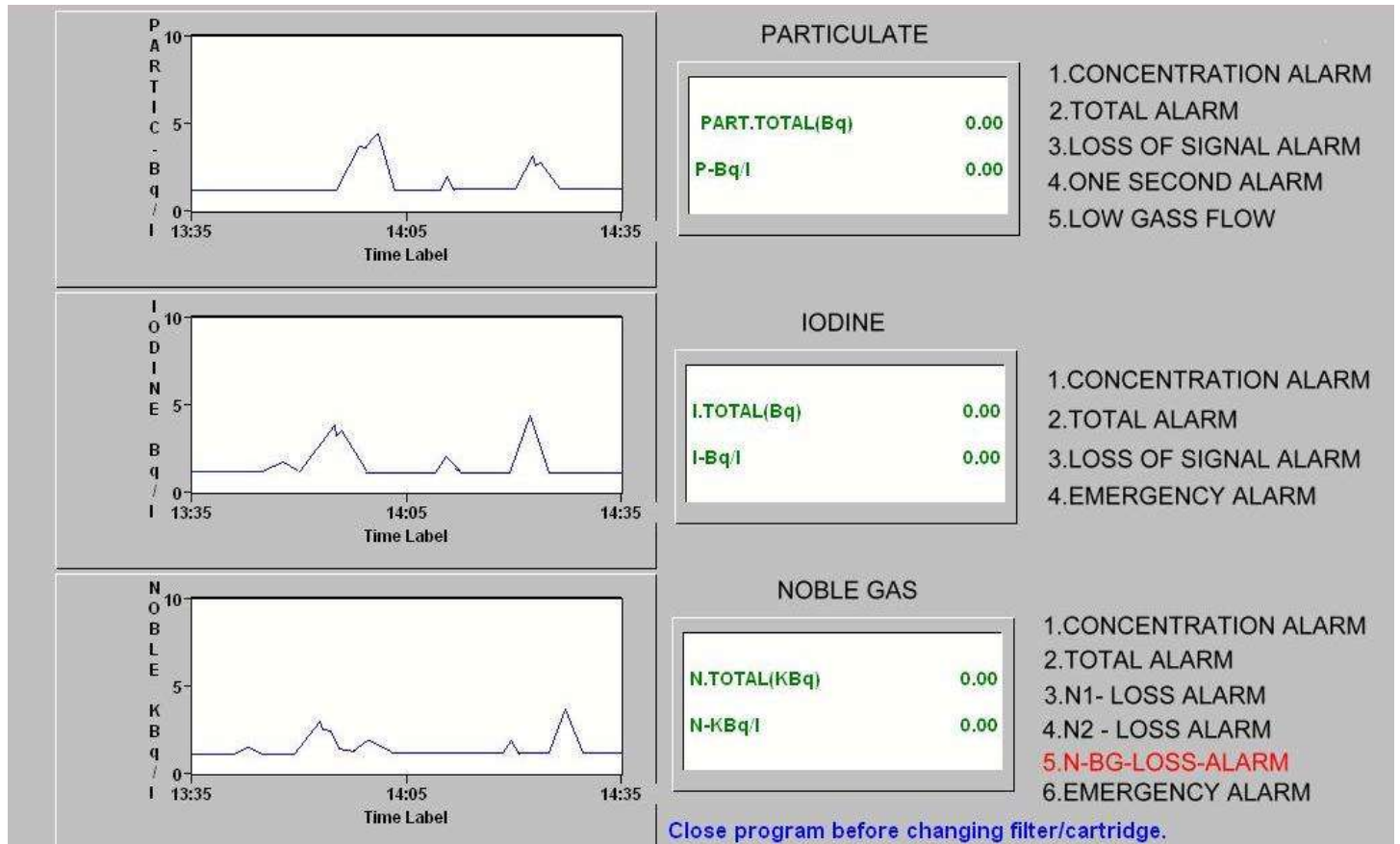
Decontamination: 去污	Shields are straight-through bore with Stainless Steel liner for easy Decontamination. Other wetted parts are stainless steel or quick + easy replacement. 铅屏直通孔, 带不锈钢内胆, 易于去污, 其它潮湿部件为不锈钢, 更换容易快速。
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Type of Detector	1 Minute	1 Hours	10 Hours	1 Day	1 Week
Particulate Beta-Gamma Cs-137,Co-58, etc	$6 \times 10^{-10}$ uCi/ml/min	$1 \times 10^{-11}$ uCi/ml $3.7 \times 10^{-7}$ Bq/ml	$1 \times 10^{-12}$ uCi/ml $3.7 \times 10^{-8}$ Bq/ml	$6 \times 10^{-13}$ uCi/ml $2.4 \times 10^{-8}$ uCi/ml	$1 \times 10^{-13}$ Bq/ml $4 \times 10^{-9}$ Bq/ml
Iodine I-131, etc	$3 \times 10^{-9}$ uCi/ml/min	$1 \times 10^{-11}$ uCi/ml $3.7 \times 10^{-1}$ Bq/ml	$1 \times 10^{-12}$ uCi/ml $3.7 \times 10^{-8}$ Bq/ml	$6 \times 10^{-13}$ uCi/ml $2.4 \times 10^{-2}$ uCi/ml	$1 \times 10^{-13}$ Bq/ml $4 \times 10^{-9}$ Bq/ml
Gas-Standard Range Xe-133,etc	$6 \times 10^{-7}$ uCi/ml	$1 \times 10^{-7}$ uCi/ml $3.7 \times 10^{-3}$ Bq/ml	$2.7 \times 10^{-8}$ uCi/ml $1 \times 10^{-3}$ Bq/ml	$1 \times 10^{-8}$ uCi/ml $3.7 \times 10^{-4}$ Bq/ml	$2.7 \times 10^{-9}$ uCi/ml $1 \times 10^{-4}$ Bq/ml

Each detector is protected against corrosion and moisture by design, construction, and 0.0005" window.  
 每个探测器设计制造为防腐蚀和防潮, 带 0.0005" window

Measurement Ranges of Optional Detectors	From	4 Decade Model	6 Decade Model
V			
Tritium	$10^{-7}$	$10^{-3}$	$10^{-1}$ uCi/cc
Inorganic C-14	$10^{-8}$	$10^{-4}$	$10^{-2}$ uCi/cc
Organic C-14	$10^{-9}$	$10^{-5}$	$10^{-3}$ uCi/cc
Alpha particulate	$5 \times 10^{-8}$	$10^{-4}$	uCi/cc

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Display Mode:  
显示模式

Model CAM-33 features a Intel Processor Computer with a Color LCD Monitor. Reads out directly in concentration-Bq/l or other units plus total activity thru CAM-33 in KBq or Curies, etc.  
 CAM-33 特点是 Intel 处理器的计算机, LCD 彩屏显示器, 直接读出浓度 Bq/l 或其它单位, 加总活度单位 KBq 或 Curies,等等



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<b>Operation:</b> 操作:	When CAM-33 continuous air monitor is in normal operation, the Color LCD Monitor displays: 当 CAM-33 连续监测器在正常状态下, 彩屏 LCD 显示如下:
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<b>High Voltage Supply:</b> 高压电源:	Separately variable from 0 to 2000. Extremely stable HV. 独立变量从 0-2000, 极其稳定 HV
<b>LCD Color Monitor:</b> LCD 彩色显示器	17 inch Monitor shows both real time concentration and accumulated dose for all channels. Data is shown both graphically and numerically. 17 英寸显示器既显示所有通道实时浓度, 有显示累加剂量。数据同时显示图形和数字。
<b>ACCURACY:</b> 精度:	+/- 10% except for resolution loss and statistical variation. 除分辨率损失和统计变化外, 精度为 +/- 10%
<b>ALARMS:</b> 报警:	Alarms are pre-settable by user to any trigger level. 用户预设任何触发水平报警
<b>Low level Alarm:</b> 低水平报警:	Automatic Reset 自动清零
<b>High Level Alarm:</b> 高水平报警	High level alarm remains activated until RESET button is pushed. 高水平报警保持激活状态, 直到按 RESET 键
<b>Alarm Indication Lights:</b> 报警指示灯	6 lamps Red-high level Amber-Low count for each channel, plus more indicators also shown on LCD monitor. 6 个灯, 红色为高水平, 每道琥珀色为低计数, 加显示器上其它指示灯
<b>Audio:</b> 音频:	1000 Hz, greater than 80db. 1000 Hz, 优于 80db.

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<b>Outputs:</b> 输出	<ol style="list-style-type: none"> <li>1. Logic Level Signal 逻辑电平信号</li> <li>2. Contact Closure or Opening 触点闭合开启</li> <li>3. Ethernet LAN Connection 以太网局域连接</li> <li>4. USB ports USB 接口</li> <li>5. DVD Writer DVD 刻录机</li> </ol>
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**AIR MOVING SYSTEM:**  
送风系统

<b>Air Pump:</b> 气泵:	Extremely rugged continuous duty- no lubrication required. 极其坚固, 连续工作, 无需润滑
<b>Pumping System:</b> 泵系统:	Pump noise is reduced by heavy duty internal muffler. 内置重型消音器降低泵噪音
<b>Oil less Pump Motor:</b> 无油泵发动机:	$\frac{3}{4}$ Horsepower, 50/60hz, capacitor start, induction run. $\frac{3}{4}$ 马力, 50/60hz, 电容起步, 异步运行
<b>Flow Control:</b> 流量控制:	Flow Regulator Controls the flow from 0-4 cfm +/- 0.2 cfm. 流量调节控制 0-4 cfm +/- 0.2 cfm
<b>Optional Flow rate Display:</b> 可选流量表显示:	On screen Flow Rate Display 0 to 4 or 0-120 lpm. 屏幕上显示 0 to 4 或 0-120 lpm
<b>Inlet and Outlet (Available):</b> 输入和输出 (供应)	(20 foot $\frac{3}{4}$ ) hose inlet: 6 meter 2.5 cm I.D. 20 foot 1" hose outlet. May be extended. (20.75 英尺) 进气软管, 6 米长, 直径 2.5cm, 20 英尺长出气管, 可延伸



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<b>Grab Sample Port: (Optional)</b>	Grab sample port.
<b>Flow Rate:</b> 流量	Factory setting is at 4 cfm. Electronic mass flowmeter feeds Real Time data to CAM-33 software. 工厂设定 4 cfm。电子质量流量表反馈实时数据给 CAM-33 软件

<b>Standard Installation:</b> 标准安装	Cart-Cabinet of heavy gauge steel. Caster mounted with five inch ball bearing casters. Rubber rim. Two of these are full 360 degree swiveling. (Skid mount is optional.) 轨钢机箱, 5 英寸球轴承脚轮, 橡胶边, 其中两个 360 度旋转
<b>Special Safety:</b> 特别安全措施:	Loss of system vacuum air flow alarm and relay switch closure. Loss of signal alarm. All system circuits are fused. 真空流报警, 继电器开关闭合, 丢失信号报警, 所有系统电路融合。
<b>Power:</b> 电源:	120 VAC – 220 VAC optional 50/60 Hz. 120 VAC – 220 VAC, 可选 50/60 Hz.
<b>Features:</b> 特点:	Thermal Protection on Motor. Positive displacement Pump 电机热保护, 正排量泵
<b>Options:</b> 可选	Three Channel push-button check sources (License Exempt Quantities) to Detect and Test each of the three channels. Also as a final option the flow rate can be increased to 30 cfm with larger pump and minor changes in the plumbing. 三道按钮检测源, 检测和测量任意一个通道, 此外, 作为最后选择, 使用较大泵, 管道流较小变化, 流量可提高到 30 cfm
<b>Dimensions:</b> 尺寸:	29" wide by 31" long by 41" high exclusive of casters. 29" 宽* 31" 长* 41" 高, 不包括脚轮
<b>Weight:</b> 重量:	1800 lbs standard. (Lighter weight models are available with 1" Shielding). 1800 磅, 标准型 (轻量型号, 带 1" 屏蔽可供应)
<b>Shipping Weight:</b> 装船重量:	1900 lbs. 1900 磅

**ELECTRONIC SYSTEM DESCRIPTION : Computer is Intel Pentium based, including:**



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电子学系统描述: Intel 计算机, 包括

1. CPU with data acquisition 带数据收集的 CPU
2. High Resolution, 17" LCD Color Monitor Display 高分辨率 17"LCD 彩色显示器
3. Mouse 鼠标
4. Graphic Printer for hard copy – 3 trace graphs. 用于硬拷贝的 3 trace 图形打印机
5. 3 Channel 4-20mA interface is provided. 提供三道 4-20mA 接口
6. Keyboard 键盘
7. Audio 音频
8. Manuals 手册
9. CD/DVD Writer Combo for archiving data from previous year.  
CD/DVD 刻录机对前一年数据存档
10. Minimum 200 gigabyte hard drive – Stores programs, plus room to add additional new software functions in the future.  
最小 200G 硬盘-存储程序, 为将来增加新软件预留的空间。
11. Non-volatile 1 year data storage. Data is stored every 2 minutes- all year.  
非易失性存储器, 一年数据存储。每 2 分钟数据存储-全年
12. Specialized Air Monitor software custom tuned and designed for the CAM-33.  
专用空气定制调整监测软件, 为 CAM-33 设计
13. Ethernet-LAN and USB ports.  
网络和 U S B 端口

**Technical Associates standard modular series – all solid state:**  
T A 标准模块系列—全固态

- 1 ea Digital Acquisition Board  
一个数字采集板
- 1 ea. MGA-5202 with 4 amplifiers including fully adjustable single channel analyzer w/ independent High Voltage power supply for scintillation detector.  
一个 MGA-5202, 带四个放大器, 包括全调整单道分析仪, 带独立闪烁探头高压电源
- 1 ea. MVR-0-5-24 Power Supply Module - individual +/- 1% stable high voltage for each detector.  
Once the high voltage levels are set by the technician, they do not change.  
MVR-0-5-24 电源模块—每个探头 +/- 1% 稳定高压, 高压值一旦设定, 不能改变
- 1 ea. HP Deskjet Color Inkjet Printer  
H P 彩色喷墨打印机一台
- 1 ea. MAL-B3 Alarm Module  
M A L – B 3 报警模块
- 1 ea. PPC-33 Pump Power Control Module  
PPC-33 泵电源控制模块



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1 ea. Mass Flow Meter with on-screen display  
带屏显的质量流量表

**Special Upgrades Incorporated Into TA CAM-33 Air Monitors:**

**特别 T A CAM-33 空气监测器升级**

- 4-20mA output signals – 3 channels

- 4-20mA 输出信号 – 3 道

- Big 17" Color LCD Monitor

大 17" 彩色 L C D 显示器

- LABTECH Virtual Instrument Software

LABTECH 虚拟仪器软件

- Real-Time Mass Flowmeter

实时流量表

- 3" Lead (Pb) shields now lighter weight due to more compact Beta-Gamma Detectors.

由于  $\beta$  -  $\gamma$  探测器更紧致, 3" 铅屏更轻。

- Optional positive position motor-driven check sources with LED position indicator with greater "throw length" to preserve low background when source is retracted and to give trouble free operation.

可选购带 LED 指示器的正位置机动检测源, "抛长" 更好, 当辐射源回缩时, 以保持低本底, 并进行无故障运行。

**CAM-33 IS A GOOD REPLACEMENT FOR PING-1A**

CAM-33 很好地替代 PING-1A

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**Other Available Options or Choices:**其它可选项目

- Shrouded probe or other air collection Nozzles are available.

带护罩探头或其它空气收集喷嘴供应

- Touch-screen feature on the LCD color monitor

带触摸屏特点 LCD 彩色显示器

- Lighter weight system with 1" shielding

更轻系统, 带 1"屏蔽

- Titanium detector cover

钛探头盖

-Other detector types to replace 2" dia. GM detectors

其它探头替代直径 2"GM 管探头

PLEASE SEE SOFTWARE "SCREEN SHOTS" FOR CAM-33 ON TA WEB PAGE  
"ALPHABETICAL LIST OF PRODUCTS".

详见 TA 网站"ALPHABETICAL LIST OF PRODUCTS".



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