

# CURIE-MeV NOBLE GAS STACK MONITOR

Ci-MeV 惰性气体烟道监测器

Model # CAM-3XG

**PURPOSE:** To measure Noble Gas content of stack gases, and to measure & record total stack release of Noble Gases in Curies - MeV, or other suitable units.

目的：测量烟道气体中的惰性气体，用单位 Ci-MeV 或其它合适的单位测量和记录烟道惰性气体总排放。

## SYSTEM DESCRIPTION

系统描述：

**AIR FLOW PATH:** Air is pulled from stack or duct thru isokinetic intake nozzles and flow meter, thru glass fiber particulate pre-filter, (and optional filter zeolite or charcoal pre-filter for airborne iodine), into a shielded measurement chamber, then out through the pump and back to the stack.

气流通道：被测气体通过等速进气嘴和流量表从烟道抽出，通过玻璃纤维尘粒预滤器（可选沸石滤池或炭预滤器），进入到带屏蔽的测量室内，然后通过泵气体排回烟道。

**DETECTOR:** Also within the shielded detection chamber is a gain stabilized spectroscopic graded NaI(Tl) Scintillation detector that detects Gammas emitted by the Noble Gas.

探测器：带屏蔽保护的探测室内是一个增益稳定的光谱级 NaI(Tl)闪烁探头用来探测惰性气体发射的 $\gamma$ 。

## CONCENTRATION and TOTAL RELEASE

**DETERMINATION:** Pulses from the NaI(Tl) detector are sorted by pulse height into three groups. Each energy window is adjustable by authorized personnel. Typical Settings are shown below:

浓度和总排放测定：NaI(Tl)探测器测出的脉冲按高度分为三组，每个能量窗可由授权人员调整，典型设定如下：

- Low Energy: Xe<sup>133</sup>, 0.035 to 0.100 MeV
- Mid Energy: Xe<sup>135</sup>, 0.100 to 0.400 MeV
- High Energy: Xe<sup>135m</sup>, 0.400 to 4.0 MeV.



CAM-3XG



**DESCRIPTION:** The **CAM-3XG** series are three channel air monitors for simultaneous measurement of  $Xe^{133}$ ,  $Xe^{135}$ , and  $Xe^{135m}$ . Like all of the CAM-3 series, these are continuous duty, high capacity, rugged skid cabinet or caster-mounted systems. Electronics are microprocessor with LCD Color display. Also preamps etc. 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.

Shields are void free lead encased in welded steel and with cadmium and copper liners for lower background and for a long, useful life and easy decontamination. 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. The air moving system is based on a high capacity air pump capable of delivering 5 cfm free air and including fine regulation in the 3 cfm operating range. The entire system is mounted in a self-contained rugged cabinet and comes complete with all cabling and connectors in place ready to operate. The standard unit is operated from 115 V single phase, 60 Hz; **Optional** 220 V, 50 or 60 Hz.

描述：CAM-3XG 系列为三通道空气监测器同时测量  $Xe^{133}$ ,  $Xe^{135}$ , and  $Xe^{135m}$ 。像所有 CAM-3 系列一样，此系列为连续作业，高负载，结实滑动柜或脚轮系统。电子学为微处理器带 LCD 彩屏。还有前置放大器等为插卡式模块以便需要时允许更改或添加额外功能，以便现场更换模块以达到快速维修。除了享有 TA 产品整年保修外，模块系统在 TA 独家一年包换范围内。屏蔽为无缝铅安装在焊接钢内，镉和铜内衬用于低本底，长寿命，易去污。过滤器通过断开 O 型密封过滤器托进行快速更换。屏蔽可以被打开以轻松更换过滤器或清洁，所有连接处和开口处密封防漏气。气动系统基于输送能力为 5 cfm 高容量气泵，包括 3cfm 操作范围微调。整个系统安装在一体的结实机柜中，配备缆线和连接件。标准型号使用 115V 单相电，60Hz. 可选购 220 V, 50 或 60 Hz

**规格 SPECIFICATIONS:** Model # CAM-3XG SPECIFICATIONS:

- **Channels:** Three Standard. Four Optional.
- **通道：**三个标准通道，可选择四通道

<b>Activity Detected:</b> 检测活度	<b>Gross beta-gamma particulate</b> 总βγ尘粒	<b>Noble Gas</b> 惰性气体
<b>Filter:</b> 滤网	2" dia. glass fiber prefilter 直径 2" 玻璃纤维预滤器	Cd & Cu Lined 镉&铜里衬
	Detector Optional. 选择探头	One Liter Chamber 一升室
<b>Energy Channels:</b> 能量通道	One Optional 可选择一个	three



**TECHNICAL ASSOCIATES - ALL RADIATION** 7051 Eton Ave. Canoga Park, CA 91303 Tel: (818) 883-7043  
**OVERHOFF TECHNOLOGY CORP. - TRITIUM** 1160 US Route 50 Milford OH 45150 Tel: (513) 248-2400

Radiation Detection & Measurement For 60 Years

## 探测器 Detectors:

- **Particulate Beta-Gamma:** 2" Pancake GM Model T-1190 (Optional).
- $\beta\gamma$ 尘粒 : 2"扁平管 GM 型号 T-1190 ( 选购 )  
**Gas Standard Range:** Gain stabilized 2" dia. x 2" NaI(Tl) model PGS-3L (Spectroscopic Grade) with magnetic shielding.
- 气体标准量程 : 稳定增益 , 直径 2". x 2" NaI(Tl)型号 PGS-3L ( 光谱级 ) 带磁屏蔽  
**Iodine (Optional):** 2" dia. x NaI(Tl) Model PGS-3LI (Spectroscopic Grade).
- 碘 ( 选项 ) : 直径 2" x NaI(Tl) Model PGS-3LI (光谱级).
- **Detector Sensitivity:** Monitor is more sensitive on all channels by factors of 5 to 500 than is required by USNRC and other regulatory agencies.
- 探测器灵敏度 : 探测器全通道是 USNRC 和其它管理机构要求的灵敏度的 5-500 倍。
- **Gas Standard Range:** 10 Ci-MeV/week - 100 KCi-MeV/week (1mCi-MeV/min. - 10 Ci-MeV/min).
- **气体标准量程 :** 10 Ci-MeV/周 - 100 KCi-MeV/周 (1mCi-MeV/min. - 10 Ci-MeV/min).
- **Energy Range:** 0.035 - 4.0 MeV.
- **能量范围 :** 0.035 - 4.0 MeV.
- **Accuracy:**  $\pm 10\%$  except for resolution loss and statistical variation.
- **精度 :** 除分辨率丢失和统计变化外为 $\pm 10\%$
- **Shielding:** 3" lead; full 4 pi.
- **屏蔽 :** 3"铅 , 全角度
- **Display Mode:** Model CAM-3XG features micro-processor control and Color LCD display.
- **显示模式 :** 型号 CAM-3XG 带微处理器控制和彩色 LCD 显示器
- **Operation:** When CAM-3XG continuous air monitor is in normal operation, the Monitor displays:
- **操作 :** 当 CAM-3XG 连续空气监测器正常工作时 , 显示器显示 :

CHANNEL 通道	REAL-TIME AIRBORNE 实时气溶胶	ACCUMULATED DOSE 累计剂量		
NAME 名字	CONCENTRATION 浓度	FOR THIS SHIFT 切换到本通道	CONCENTRATION 浓度	ACCUMULATED 累计
STATUS 状态	mCi-MeV/min. (Note 1)	Ci-MeV (Note 1)	ALARM STATUS 报警状态	DOSE ALARM 剂量报警
BETA - GAMMA $\beta$ - $\gamma$				
PARTICULATE (Optional) 尘粒 ( 选择 )	--	--	--	--
NOBLE GAS	--	--	--	--



惰性气体				
Other alarms: 其它报警	Status 状态			

**Low Air Flow** \_\_\_\_ **Loss of Signal Beta**  
**低空气流量** **β信号消失** \_\_\_\_  
 Loss of Signal Noble Gas  
 惰性其它信号消失 \_\_\_\_

**MENU OPTIONS:** 1. Modify shift length 2. Change filter

**菜单选项** 修改切换长度 更换滤网

3. Configure energies 4. Set alarms  
 能量结构 设定报警

5. Start shift 6. Save to floppy  
 开始切换 存盘

注释 1-用户可根据意愿容易更换单位 NOTE 1 - User can easily change engineering units at will.

清晰视听报警 Clear audio and visual alarms are provided.

- **High Voltage Supply:** Separately variable for each detector from 0 to 2000 V  $\mu$  A. Standard FM-5 modular series.
- **高压电源:** 每个探头从 0-2000V  $\mu$  A, 标准 FM-5 模块系列
- **Color LCD Readout:** Showing both real time concentration and accumulated dose.
- **彩色 LCD 读出器:** 实时显示浓度和累计剂量



**TECHNICAL ASSOCIATES - ALL RADIATION** 7051 Eton Ave. Canoga Park, CA 91303 Tel: (818)883-7043  
**OVERHOFF TECHNOLOGY CORP. - TRITIUM** 1160 US Route 50 Milford OH 45150 Tel: (513)248-2400

Radiation Detection & Measurement For 60 Years

# NOBLE GAS STACK MONITOR

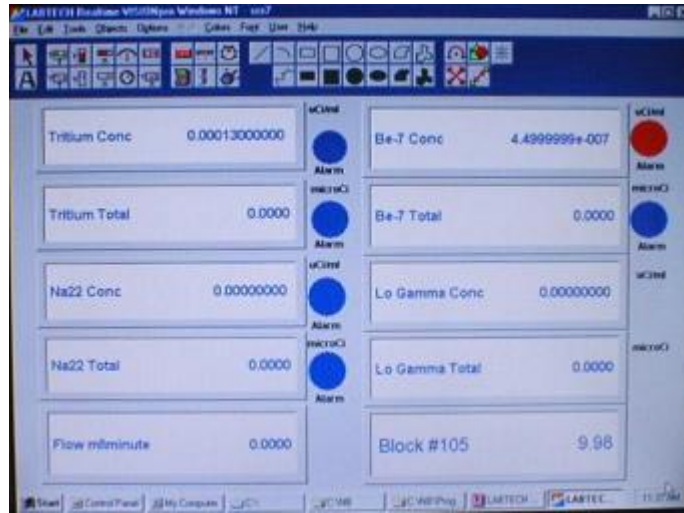
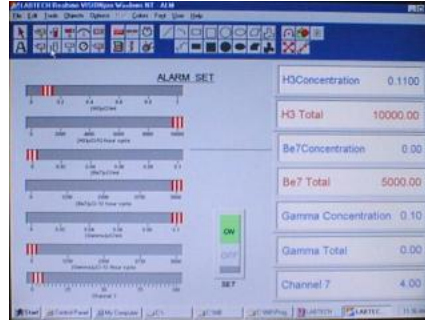
惰性气体烟道监测器

Model # CAM-3XG

Display Screens Include:

显示屏包括

- Main Display
- 主显示
- Data Review Screen
- 数据查看
- System Test Screen
- 系统测试
- Energy Set-Up/Detector Screen
- 能量设定/探头
- Alarm Alert Screen
- 报警
- And More...
- 更多...



Model **CAM-3XG** continuous air monitor automatically can save all data and set-up parameters to 3.5" floppy diskette every hour. This data can be reviewed on the Color Monitor.

型号 CAM-3XG 连续空气监测器自动存储所有数据，设定参数到 3.5 寸软盘中，此数据能够在彩色显示屏上读取。



TYPICAL DISPLAY SCREENS

## SPECIFICATIONS (continued):

规格 (继续) :

- **Alarms:** Alarms presettable to any trigger level.
  - **报警:** 报警预设到任何触发点
- Low Level Alarm: Automatic Reset



- **低限报警**：自动重设  
High Level Alarm: High level alarm remains activated until RESET is pushed.
- **高限报警**：高限报警持续激活直至按下 RESET 键  
Alarm Indication: Red-High Level, Amber-Low Level
- **报警指示**：红-高限，琥珀色-低限  
Audio: 1000 Hz, greater than 80 db. Also see Safety Features below.
- **音频**：1000 赫兹，优于 80db. 见以下安全特性
- **Air Moving System:**
- **气动系统**  
Isokinetic intake nozzle.
- **等速进气嘴**  
Flowmeter.
- **流量表**  
Particulate Air Filter.
- **尘粒空气过滤器**  
Noble Gas Measurement Chamber.
- **惰性其它测量室**  
Air Purge Port.
- **空气吹扫口**
- 
- **Air Pump**: Extremely rugged continuous duty Positive displacement low rotating speed.
- **气泵**：极其结实耐用连续工作正排量低转速  
Plumbing System: Uses quick disconnects where ever possible.
- **泵系统**：快速切断  
Pump Drive Motor: 1 HP, 50/60 Hz, capacitor start, induction run.
- **泵电机**：1 HP, 50/60 Hz，电容起动异步运行。  
Outlet: 20 foot 3/4" hose inlet: 20 foot 1" hose outlet. May be extended.
- **出口**：20 英尺直径 3/4"软管，入口：20 英尺 1"软管，可延长  
Flow Rate: Factory set at 3 cfm, can be reset up to 10 cfm with larger motor and up to 30 cfm with some plumbing change.
- **流量**：工厂设定 3cfm, 使用更大电机可重新设定为 10cfm，改变管道可使流量达到 30cfm。
- 
- **Controls:**
- **控制**

**System: ON-OFF**

**系统：开-关**

**Air: ON-OFF**

**空气：开-关**

**Printer/Recorder: ON-OFF**

**打印机/录入器：开-关**

(each channel) High Level Alarm: Set

( 每道 ) 高限报警：设定

(each channel) High Level Alarm: Reset (each channel) Low Level Alarm:Set

( 每道 ) 高限报警：重设

( 每道 ) 低限报警：设定



**(each detector) Voltage: Set**  
**( 每个探头 ) 电压 : 设定**

**(each detector) Energy Threshold/Window Set**  
**( 每个探头 ) 能量阈值/窗设定**

- **Temperature Range:** Exceeds -10° to 35°C.
- **温度范围 :** 超过-10° - 35°C.
- **Humidity:** 10-90% Relative Humidity.
- **湿度 :** 相对湿度 10-90%
- **Outputs:** Alarm condition outputs:
- **输出 :** 报警条件输出

**Logic Level Signal.**  
**逻辑电平信号**

**High Alarm.**  
**高报警**

**AC Power or UPS Loss.**  
**AC 电源或 UPS 丢失**

**Failsafe Contact Closure-or  
Opening.**  
**故障安全触点闭-合**

**Loss of Signal.**  
**信号丢失**

**Non-Standard Mode.**  
**非标准模式**

**Ethernet LAN Connection.**  
**以太网连接**

**Loss of Pump Flow.**  
**泵气流丢失**

**Computer Malfunction.**  
**计算机故障**

- **Standard Installation:** Cabinet of heavy gauge steel. Skid or caster mounted with 4 five inch ball bearing casters, two of which are full swiveling.
- **标准安装 :** 重钢机柜 , 4 个 5'滑动柜或脚轮系统 , 其中两个轮子 360 度旋转
- **Special Safety:** Loss of air flow alarm. Loss of signal alarm. All circuits fused. (See Above)
- **特别安全 :** 气流丢失报警 , 信号丢失报警。所有线路融为一体
- **Features:** Thermal protection on motor.
- **特色 :** 发动机热保护
- **Data Analysis:** Daily release log is kept. The counts from each channel are corrected for background. A standard algorithm looks at all three channels to refine the measurement of each isotope. Release rates for each isotope are calculated in Ci-MeV or Bq-MeV or other user settable units. Release rates and daily totals are graphically displayed and logged to memory with date and time stamp.
- **数据分析 :** 保存每日录入数据。每道计数进行了本底更正 , 标准计算程序监测全部三道中同位素测量。每个同位素释放率计算单位 Ci-MeV 或 Bq-MeV 或其它用户设定单位。释放率和每日总量图谱显示并录入到内存 , 带日期和时间。
- **Dimensions:** 29" wide x 31" long x 41" high exclusive of casters.
- **尺寸 :** 29" 宽 x 31" 长 x 41"高 , 不包括轮子部分
- **Power:** 120 VAC 60 Hz (240 VAC 50/60 Hz Optional).
- **电源 :** 120 VAC 60 Hz (240 VAC 50/60 Hz 选择).

#### **SPECIFICATIONS (continued):**

规格 :

- **Weight:** 600 lbs. (Lighter Weight Units Available with 1" lead shielding)



- **重量** : 600 磅 ( 带 1"铅屏重量较轻 )
- **Shipping Weight:** 800 lbs.
- **装船重量** : 800 磅
- **Options:**
- 选择 :  
Air monitor available without air mover or with alternate air movers.
- 不带鼓风机或带备用鼓风机空气监测器有供应  
Broader range 12 decades.
- 更宽量程 12 数量级  
Duplicate graphic display panels and alarms at remote locations.
- 远程图谱显示板和报警  
Different detector types.
- 不同探测器类型  
Push-button check sources (License exempt quantities).
- 按钮检测源
- Temperature controlled cabinet.
- 温度控制机柜  
Calibrated check source.
- 标定检测源  
Additional sample collector.
- 附加样品收集器

**ELECTRONIC SYSTEM DESCRIPTION** - Micro-processor is Pentium-based, including:

电子学系统描述：微处理为奔腾，包括：

**Quality CPU with data acquisition**

高质量 CPU 带数据获取

**Keyboard**

键盘

**Password Protected at both user and administration level**

用户或管理层密码保护

CD-Writer

CD 刻录

**High resolution, color**

高分辨率，彩色

Color LCD display

彩色 LCD 显示

**Mouse**

鼠标

Audio

音频

**Manuals**

菜单

Graphics printer for hard copy - 3 trace graphs

图形打印用于硬拷贝-3 道

**Specialized air monitor software.**

专用空气监测器软件

50 gigabyte hard drive - Stores programs, plus room to add additional new software functions in the future.





50G 硬盘-存储程序，外加将来增加新软件功能

All data is automatically saved to hard drive and can easily be saved to floppy disk or CD.

所有数据自动存到硬盘，也可以容易地存到软盘或 CD。

UPS Power-Supply with 10-20 minute battery back-up for computer.

UPS 电源可供电 10-20 分钟

Technical Associates Software Provides:

TA 软件提供

**Process Control & Monitoring.**

过程控制&监测

**Data Acquisition, Recording & Reports.**

数据获取，收录和报告

**System Calibration & Stand-By Notes.**

系统标定和&备用注释

**Noise Rejection Electromagnetic & Ground Wire.**

噪音抑制电磁及接地线

**Procedures for Maintenance & Operation are given in Manuals.**

手册中有维护和操作流程

**Data Analysis & Processing.**

数据分析与处理

Historical Data Retrieval

历史数据检索

Software Licenses are Included.

包括软件协议

Easy Calibration & Easy Maintenance.

容易校准和维护

Technical Associates standard modular series - all solid state.

TA 标准模块系列-全固态

1 ea. MVR-5R Power Supply.

电源 MVR-5R 一个

1 ea. LNM-5 Strip Chart Recorder or GRP-10 graphics printer.

带状图记录器 LNM-5 或图形打印机 GRP-10 一台

1 ea. Flow Gauge.

流量仪表一台

1 ea. MC3A 3 Channel Energy Analyzer (SCA).

3 道能量分析仪 MC3A 一个



**TECHNICAL ASSOCIATES - ALL RADIATION  
OVERHOFF TECHNOLOGY CORP. - TRITIUM**

**7051 Eton Ave. Canoga Park, CA 91303 Tel: (818)883-7043  
1160 US Route 50 Milford OH 45150 Tel: (513)248-2400**

**Radiation Detection & Measurement For 60 Years**