

# CURIE-MeV NOBLE GAS STACK MONITOR

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.

## SYSTEM DESCRIPTION

**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 prefilter for airborne iodine), into a shielded measurement chamber, then out through the pump and back to the stack.

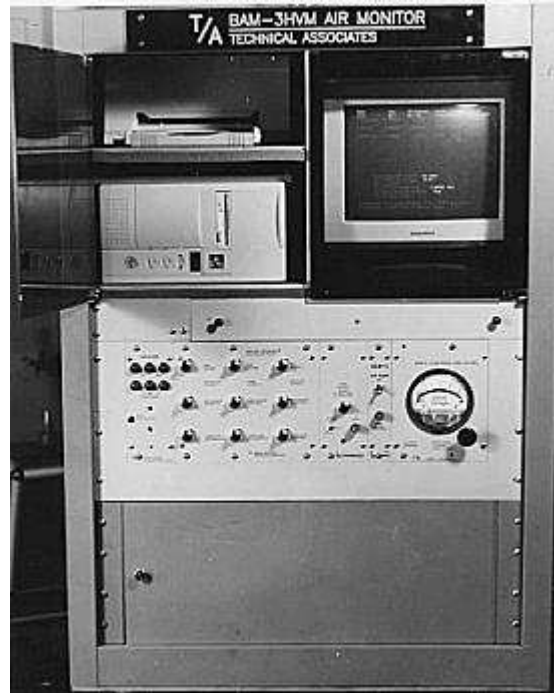
**DETECTOR:** Also within the shielded detection chamber is a gain stabilized spectroscopic graded NaI(Tl) Scintillation detector that detects Gammas emitted by the Noble Gas.

**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:

- Low Energy:  $Xe^{133}$ , 0.035 to 0.100 MeV
- Mid Energy:  $Xe^{135}$ , 0.100 to 0.400 MeV
- High Energy:  $Xe^{135m}$ , 0.400 to 4.0 MeV.

**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.



**CAM-3XG**

**T/A TECHNICAL ASSOCIATES**  
7051 ETON AVENUE \* CANOGA PARK, CA 91303 TELEPHONE (818) 883-7043 \* FAX(818) 883-6103

\$Revision: 1.1 \$

# NOBLE GAS STACK MONITOR

Model # CAM-3XG

**SPECIFICATIONS:**

**Channels:** Three Standard. Four Optional.

<b>Activity Detected:</b>	<b>Gross beta-gamma particulate</b>	<b>Noble Gas</b>
<b>Filter:</b>	2" dia. glass fiber prefilter Detector Optional.	Cd & Cu Lined One Liter Chamber
<b>Energy Channels:</b>	One Optional	three

**Detectors:** **Particulate Beta-Gamma:** 2" Pancake GM Model T-1190 (Optional).  
**Gas Standard Range:** Gain stabilized 2" dia. x 2" NaI(Tl) model PGS-3L (Spectroscopic Grade) with magnetic shielding.  
**Iodine (Optional):** 2" dia. x NaI(Tl) Model PGS-3LI (Spectroscopic Grade).

**Detector Sensitivity:** Monitor is more sensitive on all channels by factors of 5 to 500 than is required by USNRC and other regulatory agencies.

**Gas Standard Range:** 10 Ci-MeV/week - 100 KCi-MeV/week (1mCi-MeV/min. - 10 Ci-MeV/min).

**Energy Range:** 0.035 - 4.0 MeV.

**Accuracy:** ± 10% except for resolution loss and statistical variation.

**Shielding:** 3" lead; full 4 pi.

**Display Mode:** Model **CAM-3XG** features micro-processor control and Color LCD display.

**Operation:** When **CAM-3XG** continuous air monitor is in normal operation, the Monitor displays:

CHANNEL NAME STATUS	REAL-TIME AIRBORNE CONCENTRATION mCi-MeV/min. (Note 1)	ACCUMULATED DOSE FOR THIS SHIFT Ci-MeV (Note 1)	CONCENTRATION ALARM STATUS	ACCUMULATED DOSE ALARM
BETA - GAMMA PARTICULATE (Optional)	—	—	—	—
NOBLE GAS	—	—	—	—
Other alarms:	status			
	Low Air Flow ___	Loss of Signal Beta ___		
		Loss of Signal Noble Gas ___		

- MENU OPTIONS:**
- |                        |                   |
|------------------------|-------------------|
| 1. Modify shift length | 2. Change filter  |
| 3. Configure energies  | 4. Set alarms     |
| 5. Start shift         | 6. Save to floppy |

NOTE 1 - User can easily change engineering units at will.

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.

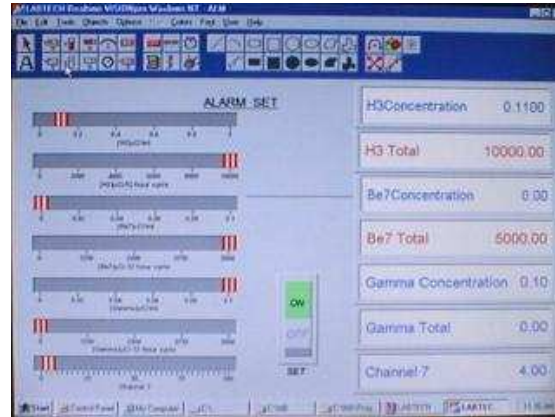
**Color LCD Readout:** Showing both real time concentration and accumulated dose.


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

\$Revision: 1.1 \$

# NOBLE GAS STACK MONITOR

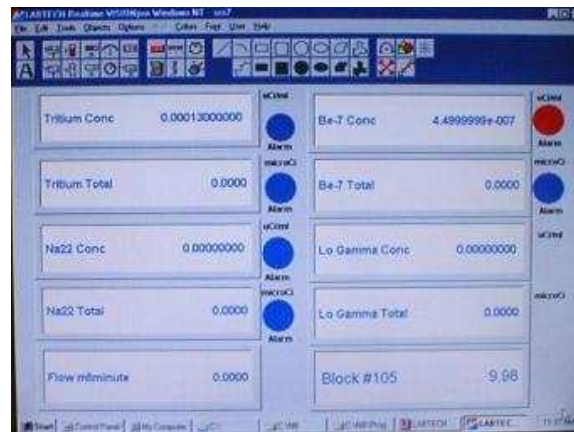
Model # CAM-3XG



Display Screens Include:

- Main Display
- Data Review Screen
- System Test Screen
- Energy Set-Up/Detector Screen
- Alarm Alert Screen
- And More...

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.



TYPICAL DISPLAY SCREENS

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

\$Revision: 1.1 \$

# NOBLE GAS STACK MONITOR

Model # CAM-3XG

## SPECIFICATIONS (continued):

- Alarms:** Alarms presettable to any trigger level.  
Low Level Alarm: Automatic Reset  
High Level Alarm: High level alarm remains activated until RESET is pushed.  
Alarm Indication: Red-High Level, Amber-Low Level  
Audio: 1000 Hz, greater than 80 db. Also see Safety Features below.
- Air Moving System:** Isokinetic intake nozzle.  
Flowmeter.  
Particulate Air Filter.  
Noble Gas Measurement Chamber.  
Air Purge Port.  
Air Pump: Extremely rugged continuous duty Positive displacement low rotating speed.  
Plumbing System: Uses quick disconnects where ever possible.  
Pump Drive Motor: 1 HP, 50/60 Hz, capacitor start, induction run.  
Outlet: 20 foot 3/4" hose inlet: 20 foot 1" hose outlet. May be extended.  
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.
- Controls:** System: ON-OFF  
Printer/Recorder: ON-OFF  
(each channel) High Level Alarm: Reset  
(each detector) Voltage: Set  
Air: ON-OFF  
(each channel) High Level Alarm: Set  
(each channel) Low Level Alarm: Set  
(each detector) Energy Threshold/Window Set
- Temperature Range:** Exceeds -10<sup>o</sup> to 35<sup>o</sup>C.
- Humidity:** 10-90% Relative Humidity.
- Outputs:** Alarm condition outputs:  
Logic Level Signal. High Alarm. AC Power or UPS Loss.  
Failsafe Contact Closure-or Opening. Loss of Signal. Non-Standard Mode.  
Ethernet LAN Connection. Loss of Pump Flow. Computer Malfunction.
- Standard Installation:** Cabinet of heavy gauge steel. Skid or caster mounted with 4 five inch ball bearing casters, two of which are full swiveling.
- Special Safety:** Loss of air flow alarm. Loss of signal alarm. All circuits fused. (See Above)
- Features:** Thermal protection on motor.
- 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.
- Dimensions:** 29" wide x 31" long x 41" high exclusive of casters.
- Power:** 120 VAC 60 Hz (240 VAC 50/60 Hz Optional).



## TECHNICAL ASSOCIATES

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

\$Revision: 1.1 \$

# NOBLE GAS STACK MONITOR

Model # CAM-3XG

## SPECIFICATIONS (continued):

- Weight:** 600 lbs. (Lighter Weight Units Available with 1" lead shielding)
- Shipping Weight:** 800 lbs.
- Options:** Air monitor available without air mover or with alternate air movers.  
Broader range 12 decades.  
Duplicate graphic display panels and alarms at remote locations.  
Different detector types.  
Push-button check sources (License exempt quantities).  
Temperature controlled cabinet.  
Calibrated check source.  
Additional sample collector.

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

- |  |   |
|--|---|
| Quality CPU with data acquisition                        | Keyboard  |
| Password Protected at both user and administration level | CD-Writer                                       |
| High resolution, color                                   | Color LCD display                               |
| Mouse  | Audio   |
| Manuals  | Graphics printer for hard copy - 3 trace graphs |
| Specialized air monitor software.                        |   |

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

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

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

### Technical Associates Software Provides:

- |  |                                      |
|--|--------------------------------------|
| Process Control & Monitoring.                                | Data Analysis & Processing.          |
| Data Acquisition, Recording & Reports.                       | Historical Data Retrieval            |
| System Calibration & Stand-By Notes.                         | Software Licenses are Included.      |
| Noise Rejection Electromagnetic & Ground Wire.               | Easy Calibration & Easy Maintenance. |
| Procedures for Maintenance & Operation are given in Manuals. |                                      |

Technical Associates standard modular series - all solid state.

- 1 ea. MVR-5R Power Supply.
- 1 ea. LNM-5 Strip Chart Recorder or GRP-10 graphics printer.
- 1 ea. Flow Gauge.
- 1 ea. MC3A 3 Channel Energy Analyzer (SCA).

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

\$Revision: 1.1 \$