



National Institutes of Health  
Bethesda, Maryland 20205  
Building : 21  
Room : 106  
(301) 496- 5774

June 28, 1989

Mr. Mohamed Shanbaky, Chief  
Nuclear Materials Safety Section  
U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406

Dear Mr. Shanbaky:

This letter confirms our conversation of June 20, 1989, during which you indicated that the NIH would be required to design and install an alarming radiation monitoring system to provide an audible and visible warning should a "significant" source of radioactivity be present in an MPW box destined for incineration. The design criteria for this system was agreed to be a detector system which would alarm should a source of Cs-137 of 1 mCi (37 MBq) be present in the MPW box.

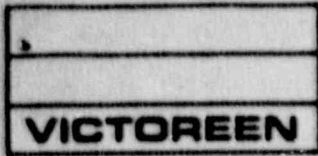
We have identified an instrument which appears to be capable of performing this function (the Victoreen 828 GammaGuard Area Monitor; description enclosed) and we are in the process of purchasing two of the units. They will be installed and operational for the required monitoring as soon as possible following receipt, acceptance testing and calibration. We, of course, reserve the right to use an alternative monitoring system appropriate for the purpose if necessary in the future.

If you have any questions regarding this matter please contact me at 301-496-5774.

Sincerely,

Robert A. Zoon,  
Acting Chief  
Radiation Safety Branch

Attachment

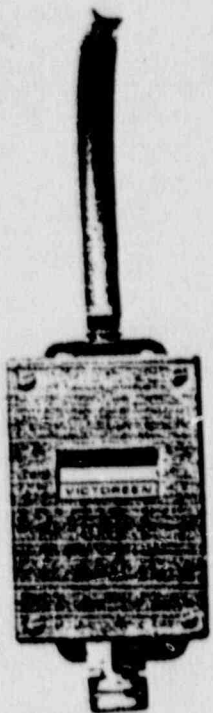


VICTOREEN, INC.  
 (216) 248-9300  
 FAX (216) 248-9301

D.01-100 mR  
 \$1,750

# Model 828 GammaGuard Area Monitor

SECTION 4



- Rugged NEMA 4 construction for dust and watertight applications.
- Reliable sensitive and continuous monitoring of uncontrolled areas.

- Self-contained visual and audible alarms are internally adjustable over fullscale.
- Anti-jam circuitry prevents erroneous readings at high radiation levels.

The Model 828, Victoreen GammaGuard Area Monitor, is ideal for a wide range of area monitoring applications. This self-contained unit has one external control: A manual alarm acknowledge push button. To activate the "GammaGuard", simply turn on the power switch and set the internal control for the desired alarm trip level ... the "GammaGuard" functions automatically.

assured notification of hazardous conditions. Solid-state anti-jam circuitry prevents erroneous downscale readings in high radiation fields which exceed fullscale. The alarm setpoint control is internally mounted to prevent unauthorized tampering with the preset alarm level, which can be set anywhere from background to fullscale with selectable manual or automatic reset. Alarm setpoint may be verified with an internally mounted alarm trip test circuit.

Operational status is continually apparent by means of a white failure light. A highly visible red alarm light provides

## SPECIFICATIONS

**Radiation Detected:** Gamma and X-Rays, above 50 keV.

**Operating Range:** 4-Decade logarithmic response, 0.1 to 1000 mR/hr or 0.01 to 100 mR/hr.

**Response Time:** Alarms in less than 1 second for intensity which is twice the alarm setting.

**Calibration:** Within 15% on single point with  $^{60}\text{Co}$ .

**Energy Dependence:** Within 20% from 50 keV to 1 Mev.

**Environmental Effects:** Temperature limits: -20 degrees C to + 50 degrees C. Humidity limits: 0 to 100 percent. Temperature dependence within 0.15%/degree C.

**Current Consumption:**

- 120 Vac operation/normal status 135 mA
- 120 Vac operation/alarm status 270 mA
- 12 Vdc operation/normal status 300 mA
- 12 Vdc operation/alarm status 470 mA

**Stability:** Within 2% of reading.

**Detector:** Halogen quenched, energy compensated Geiger-Mueller tube.

**Display:** 4.33 in. (11.4 cm) meter.

**Alarms:** Loud continuous or pulsed audible tone, large red alarm light and DPDT relay for connecting a remote alarm.

**Alarm Set Point:** Internally adjustable anywhere on scale.

**Alarm Trip Test:** Internally mounted for verification of alarm set point.

**Alarm Reset:** Choice of manual or automatic by jumper selection.

**Alarm Acknowledge:** Externally mounted to silence the audible alarm until radiation level falls below set point. The visual alarm remains illuminated after alarm acknowledge until radiation level falls below set point.

**Exposure Rate Limitations:** Anti-jam circuitry prevents erroneous downscale readings at high radiation levels.

**Fail Indicator:** Large white fail light indicates normal operation.

**Remote Alarm:** DPDT contacts rated 5 amperes at 115 Vac, or 2.5 amperes at 220 Vac, for "fail" and "high".

**Remote meter/recorder Output:** 0-50  $\mu\text{A}$ dc. (4 to 20 mA dc optional).

**Mounting:** Both readout and detector assembly are wall mounted using standard commercial grade hardware.

**Power Requirements:** 120/240 Vac 50/50Hz., or 12 Vdc.

**Controls:** External manual acknowledge pushbutton, internal alarm set point and trip test potentiometers.

**Construction:** Rugged NEMA 4 enclosure for dust and watertight applications.

**Dimensions:**

- Readout: 14.0" (35.6 cm) X 12.0" (30.5 cm) X 6.0" (15.2 cm).

- Detector: 13.0" (33.0 cm) X 4.0" (10.2 cm) 3.0" (7.6 cm).

Weight:

- Readout 26.0 lbs. (11.7 kg)

- Detector: 3.0 lbs. (1.4 kg)

**Shipping Volume:** 4.2 Cu. Ft. (0.12 Cu. Meters)

### Preamplifier:

**Output Signal:** 5 volt peak, 50 Ohms maximum

**Input Impedance:** 100K Ohms

**Output Impedance:** 50 Ohms

**Discriminator Level:** 0 to +2 volts

**Anti-Jam Level:** 0 to +3 volts

**Anti-Jam Oscillator Frequency:** Approximately 50KHZ

**Housing:** NEMA 4

**Power:** +15 VDC, 20 mA

**Output Pulse:** Negative

**Input Pulse:** Negative

**Cable Length to readout max.** 2000 feet

**Dimensions:** 8.6" x 4.2" x 3.2"

**Weight:** 2.4 lbs. (1.2 kg)

