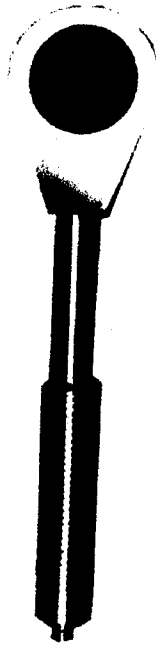


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**Instruction  
Manual**



**Model 360 Pancake Probe**

## MODEL 360 Alpha, Beta, Gamma Detector

### 1. GENERAL

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The Model 360 GM (Pancake) Detector will detect Alpha, Beta, and Gamma radiation. Its size and shape provide easy handling for surveying or personnel monitoring. The detector is energy dependent, over responding by a factor of six in the 60 keV - 100 keV range when normalized to  $^{137}\text{Cs}$ .

The thin mica window is protected by a 79% open stainless steel screen. The GM tube can be easily removed for replacement if necessary.

The GM detector operates between 850 - 1000 volts. The tube manufacturer recommends operation at approximately 900V. The recommended instrument input sensitivity is approximately 30 mV or higher to prevent the detector from double pulsing.

The GM tube face can rupture above 8000 feet altitude pressure. Consequently, detectors carried in unpressurized aircraft above this altitude would be subject to failure.

The Model 360 will operate with any Ludlum instruments or equivalent instruments that provide 900 VDC and an input sensitivity of approximately 30 mV or higher.

### 2. SPECIFICATIONS

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**DETECTOR:** Pancake type halogen quenched G-M

**WINDOW:**  $1.7 \pm 0.3$  mg/cm<sup>2</sup> mica

**WINDOW AREA:**

Active - 15 cm<sup>2</sup>

Open - 12 cm<sup>2</sup>

**EFFICIENCY(2pi geometry):** Typically 10% -  $^{14}\text{C}$ ; 45% -  $^{90}\text{Sr}/^{90}\text{Y}$ ;  
38% -  $^{99}\text{Tc}$ ; 65% -  $^{32}\text{P}$ ; 30% -  $^{239}\text{Pu}$

**SENSITIVITY:** Typically 3300 cpm/mR/hr ( $^{137}\text{Cs}$  gamma )

**ENERGY RESPONSE:** Energy dependant

**DEAD TIME:** Typically 80 $\mu$ s

**COMPATIBLE INSTRUMENTS:** General purpose survey meters, ratemeters, and scalers

**OPERATING VOLTAGE:** 900 volts

**CONNECTOR:** Series "C" (others available )

## MODEL 360 Alpha, Beta, Gamma Detector

### 2. SPECIFICATIONS (cont.)

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**CONSTRUCTION:** Aluminum housing with beige polyurethane enamel paint and stainless steel protective screen (79% open)

**TEMPERATURE RANGE:** 5°F(-15°C) to 122°F(50°C)  
May be certified to operate from -40°F(-40°C) to 150°F(65°C)

**SIZE:** 1.8" (4.6 cm)H X 2.7" (6.9 cm)W X 10.7" (27.2 cm)L  
**WEIGHT:** 1 lb (0.5kg)

### 3. PRELIMINARY INSTRUCTIONS

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#### UNPACKING AND REPACKING

Remove calibration certificate or detector functional check certificate and place it in a secure location. Remove the detector and accessories (cable, etc.) and ensure that all of the items listed on the packing list are in the carton. If more than one detector is in carton refer to the calibration certificate(s) for serial number(S/N) match. The M44-9 S/N is located on the bottom plate of the detector.

To return the instrument for repair or calibration provide sufficient packing material to prevent damage during shipment and appropriate warning labels to ensure careful handling. The following items and information should also be included to insure a quick turnaround time on your repair/ calibration:

- instrument(s) and related cable(s)
- brief information as to the reason for return
- description of service requested
- return shipping address
- customer name and telephone number

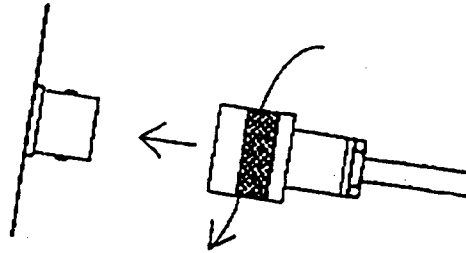
**NOTE:** When shipping a Model 360 by air, it is necessary to ship the tube in a sealed container to avoid sudden atmospheric changes which could rupture the tube.

## MODEL 360 Alpha, Beta, Gamma Detector

### 4. OPERATING PROCEDURES

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#### CONNECTING DETECTOR TO INSTRUMENT

Connect one end of the cable provided to the detector by firmly pushing the connectors together while twisting clockwise 1/4 turn until it latches. Repeat the process in the same manner with the other end of the cable and the instrument.

#### TESTING THE DETECTOR

1. Insure that the instrument HV is at the proper setting for the detector (900 volts)
2. Connect the detector to the instrument and check for a proper background reading. (*Typically 25 - 50 cpm at a background level of 8 - 15  $\mu$ R/hr*)
3. Expose the detector to a check source and verify that the instrument indicates within  $\pm 20\%$  of the check source reading obtained during the last calibration. Alternatively, expose the detector to a check source of a known value and verify that the detector gets greater than or equal to the efficiency listed in the specification section of this manual.
4. Instruments that meet these criteria are ready for use. Failure to meet these criteria may indicate a malfunction in the detector.

### 5. TUBE REPLACEMENT

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1. Remove the back plate by removing the three screws.
2. Loosen the three set screws on the side of the tube housing.
3. Remove the old tube from the detector housing.
4. Remove the anode clip from old tube.
5. Push the clip onto the anode housing.

NOTE: Do not over flex the wire when installing the clip.

## MODEL 360 Alpha, Beta, Gamma Detector

### 5. TUBE REPLACEMENT

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6. Carefully install tube with window face down in housing and tighten set screws evenly. The tube should be flush against the screen.
7. Replace the back plate and retaining screws.
8. The detector is now ready for use.

**NOTE:** The instrument and detector will need to be recalibrated once the above procedure is complete.

**CAUTION:** The mica window of this tube is extremely thin and will break easily. There is also a thin layer of material to prevent UV interference. The material may come off if touched, thus causing the detector to malfunction.

**DO NOT TOUCH.**

### 6. PARTS LIST; DRAWINGS; DIAGRAMS

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Model 360 Alpha-Beta-Gamma Detector		
Ref. No.	Description	Part No.
UNIT	Completely Assembled Model 360 Alpha-Beta- Gamma Detector	47-1539
*	DETECTOR BODY	2002-109
*	HANDLE GRIP	7002-426
*	GM TUBE (LND 7311, TGM N1002	01-5008
*	SOCKET SET SCREWS (10-34 X 1/4), 3 EACH	17-8560
*	PENCIL CLIP	01-5237
*	RESISTOR, 3.3 MEGOHMS	10-7040
*	CONNECTOR, UG 706/U	13-7751
*	HV WIRE	21-9312
*	PROTECTIVE SCREEN	21-9586
*	RED PROTECTIVE CAP	03-5476

MODEL 360 Alpha, Beta, Gamma Detector  
 6. PARTS LIST; DRAWINGS; DIAGRAMS

