

**LUDLUM MODEL 44-88 & 44-88-1  
CYLINDRICAL PANCAKE DETECTOR**

**January 2012**

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CYLINDRICAL PANCAKE DETECTOR**

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**LUDLUM MEASUREMENTS, INC**  
501 OAK STREET, P.O. BOX 810  
SWEETWATER, TEXAS 79556  
325-235-5494, FAX: 325-235-4672

## **STATEMENT OF WARRANTY**

Ludlum Measurements, Inc. warrants the products covered in this manual to be free of defects due to workmanship, material, and design for a period of twelve months from the date of delivery. The calibration of a product is warranted to be within its specified accuracy limits at the time of shipment. In the event of instrument failure, notify Ludlum Measurements to determine if repair, recalibration, or replacement is required.

This warranty excludes the replacement of photomultiplier tubes, G-M and proportional tubes, and scintillation crystals which are broken due to excessive physical abuse or used for purposes other than intended.

There are no warranties, express or implied, including without limitation any implied warranty of merchantability or fitness, which extend beyond the description of the face there of. If the product does not perform as warranted herein, purchaser's sole remedy shall be repair or replacement, at the option of Ludlum Measurements. In no event will Ludlum Measurements be liable for damages, lost revenue, lost wages, or any other incidental or consequential damages, arising from the purchase, use, or inability to use product.

## **RETURN OF GOODS TO MANUFACTURER**

If equipment needs to be returned to Ludlum Measurements, Inc. for repair or calibration, please send to the address below. All shipments should include documentation containing return shipping address, customer name, telephone number, description of service requested, and all other necessary information. Your cooperation will expedite the return of your equipment.

**LUDLUM MEASUREMENTS, INC.  
ATTN: REPAIR DEPARTMENT  
501 OAK STREET  
SWEETWATER, TX 79556**

**800-622-0828 325-235-5494  
FAX 325-235-4672**

**Model 44-88 & 44-88-1  
Cylindrical Pancake Detector**

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**Model 44-88 & 44-88-1**  
**Cylindrical Pancake Detector**

**1. GENERAL**

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The Model 44-88 and 44-88-1 Cylindrical GM (Pancake) Detectors will detect alpha, beta, and gamma radiation. The two detectors are similar. The only difference is the length of the detector. The detector is energy dependent, over-responding by a factor of 6 in the 60 keV to 100 keV range when normalized to  $^{137}\text{Cs}$ .

The thin window is protected by a 79% open beryllium copper screen. The GM tube can easily be removed for repair. (Refer to the drawing at the end of this manual for detail of construction and parts.)

The GM detector operates at 850-1000 volts. The tube manufacturer recommends operation at 900 V. The recommended

instrument input sensitivity is approximately 30 mV or higher to keep the detector from double pulsing. The double-pulse is caused by the size of the after-pulse exceeding the instrument threshold.

The GM tube face is also susceptible to rupture above 2438 m (8000 ft) altitude pressure. Consequently, detectors carried in unpressurized aircraft above this altitude would be subject to failure.

The Model 44-88 and 44-88-1 detectors will operate with any of the Ludlum instruments or equivalent instruments that provide 900 V and an input sensitivity of approximately 30 mV or higher.

**2. SPECIFICATIONS**

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- **Operating Voltage:** 900-1100 V (900 V typical)
- **Window Thickness:** 1.7  $\pm$ 0.3 mg/cm<sup>2</sup> mica
- **Window Area:** 15.5 cm<sup>2</sup>
- **Window Protective Screen:** 79% open
- **Efficiency (4 $\pi$ ):** 5% for  $^{14}\text{C}$ ; 22% for  $^{90}\text{Sr}/^{90}\text{Y}$ ; 19% for  $^{99}\text{Tc}$ ; 32% for  $^{32}\text{P}$ ; 15% for  $^{239}\text{Pu}$
- **Weight:** 0.22 kg (0.50 lb)
- **Size:**  
Model 44-88: 5.9 x 7 cm (2.3 x 2.8 in.) (Dia x L)  
Model 44-88-1: 5.9 x 14 cm (2.3 x 5.5 in.) (Dia x L)

**Model 44-88 & 44-88-1  
Cylindrical Pancake Detector**

**3. PARTS LIST**

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**Model 44-88 & 44-88-1 Cylindrical Pancake Detector**

<u>Ref. No.</u>	<u>Description</u>	<u>Part No.</u>
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UNIT

1	Completely Assembled Model 44-88 Cylindrical Pancake G-M Detector	47-2356
	OR	
1	Completely Assembled Model 44-88-1 Cylindrical Pancake	47-2895
1	GM TUBE - (N1006)	01-5273
1	CONNECTOR, UG 706/U	13-7751
1	PROTECTIVE SCREEN	7241-008
1	4-40 x 3/16 FH SCREWS	17-8811
1	LUG-1497	18-8766

Model 44-88 & 44-88-1  
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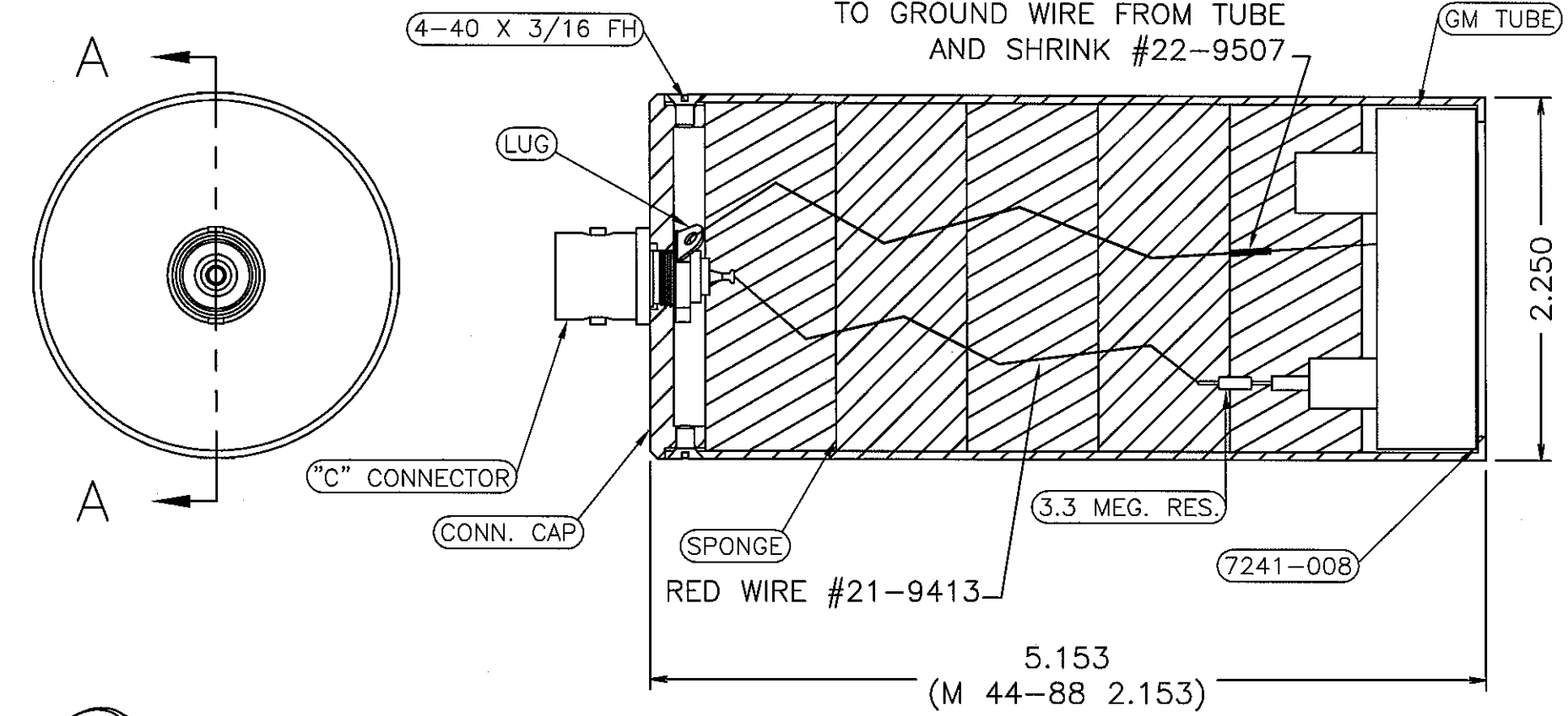
**4. DRAWINGS AND DIAGRAMS**

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Assembly View, Drawing 2 X 329

REV #	ALTERATIONS	DATE	BY
1	VALID	1/28/02	DSW
2	ECF# 2429	10/14/10	CMC

SPLICE BLACK WIRE #21-9312  
TO GROUND WIRE FROM TUBE  
AND SHRINK #22-9507



NOTE:  
M 44-88 USES  
2 PCS. OF SPONGE  
TO HOLD GM TUBE  
IN PLACE

4002-521

DWN DATE CMC 10/14/10	CHECKED JGW 10-14-10	APPROVED
TITLE: M 44-88-1 & M 44-88 ASSEMBLY		
LUDLUM MEASUREMENTS, INC. 501 DAW STREET SWEETWATER, TEXAS 75586	SERIES 2	SHEET 329