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Cc: jdempsey@uhsww.com
Subject: NRC RAML 47-25408-01 Renewal
Date: Wednesday, September 04, 2013 11:47:05 AM
Attachments: [M44-9.pdf](#)
[M44-6.pdf](#)

Hello Lester – I checked with Juanita Dempsey and the corporate name for this licensee is Ultimate Health Services but they do business as Huntington Internal Medicine Group. Nothing has changed relative to name or ownership (or otherwise) from their current license and their renewal application. I also confirmed that the radiation survey meters are 2 Ludlum 14C's; one with a 44-9 pancake probe, and the other with a 44-6 side window probe. Data sheets are attached. Please let us know if there are any questions or if we may be of assistance. Thank you - Jim

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**LUDLUM MODEL 44-9
ALPHA, BETA, GAMMA DETECTOR**

**February 2010
Serial Number PR090405 and Succeeding
Serial Numbers**

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Introduction

The Ludlum Model 44-9 GM (Geiger-Mueller) Detector detects alpha, beta, and gamma radiation. Its size and shape (pancake) provide easy handling for surveying or personnel monitoring. The detector is energy dependant, over-responding by a factor of 6 in the 60 keV to 100 keV range when normalized to ¹³⁷Cs.

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

This detector operates between 850-1000 volts, with a recommendation from the tube manufacturer of approximately 900 Vdc. Recommended instrument input sensitivity is approximately 30 mV or higher to prevent the detector from double pulsing (where the detector "counts" a single pulse from the instrument multiple times.)

Caution!

The GM tube face can rupture above 8000 feet in altitude. When transporting this detector by air, use an airtight container in order to avoid sudden atmospheric changes resulting in tube failure.

The Ludlum Model 44-9 will operate with any Ludlum instruments or equivalent instruments that provide 900 Vdc and an input sensitivity of approximately 30 mV or higher.

Unpacking and Repacking

Remove the calibration certificate or detector functional check certificate and place it in a secure location. Remove the detector(s) and accessories (if applicable) and ensure that all items listed on the packing list are in the carton. If multiple detectors are included, refer to the calibration certificates for serial number (SN) matches. The Model 44-9 serial number is located on the detectors' bottom plate.

To return an instrument or detector for repair or calibration, provide sufficient packing material to prevent damage during shipment (see "Caution!" in Introduction section) and affix appropriate warning labels to promote careful handling. The following items and information should also be included to ensure quick turnaround time of your equipment.

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

Specifications

Efficiency (4π geometry): typically 5% for ^{14}C ; 22% for $^{90}\text{Sr}/^{90}\text{Y}$; 19% for ^{99}Tc ; 32% for ^{32}P ; 15% for ^{239}Pu ;
 $\leq 1\%$ for $^{99\text{m}}\text{Tc}$

Sensitivity: typically 3300 cpm per mR/hr (^{137}Cs gamma)

Energy Response: energy dependent (please see graphs on page 7)

Background: 60 cpm

Dead Time: typically 80 μs

Window: 1.7 ± 0.3 mg/cm² mica

Model 44-9 Alpha, Beta and Gamma Detector

Window Area: active is 15 cm²; open is 12 cm²

Detector: pancake-type halogen quenched GM

Detector Operating Voltage: 900 Vdc

Compatible Instruments: general purpose survey meters, ratemeters, and scalars.

Connector: series "C" (others available)

Construction: aluminum housing with beige powder-coat finish; stainless steel protective screen (79% open)

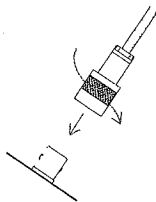
Temperature Range: -15 to 50 °C (5 to 122 °F); may be certified for -40 to 65 °C (-40 to 150 °F)

Size: 4.6 x 6.9 x 27.2 cm (1.8 x 2.7 x 10.7 in.) (H x W x L)

Weight: 0.5 kg (1 lb)

Operating Procedures

CONNECTING TO AN INSTRUMENT



Connect one end of the cable provided to the detector by firmly pushing the connector together while twisting clockwise a quarter of a turn until latched. Repeat the process in the same manner with the other end of the cable and the instrument.

TESTING THE DETECTOR

1. Ensure that the instrument high voltage (HV) is at the proper setting for the detector (900 volts)

Model 44-9 Alpha, Beta and Gamma Detector

2. Connect the detector to the instrument and check for a proper background reading (typically 25-50 cpm at 8-15 $\mu\text{R/hr}$).
3. Expose the detector to a check source and verify that the instrument indicates within 20% of the check source reading from the last calibration. Alternatively, expose the detector to a source of known value and verify that the detector detects greater than or equal to the efficiency listed in the specification section of this manual.
4. Instruments and detectors that meet these criteria are ready for use. Failure to meet these criteria may indicate a malfunction in the detector.

Tube Replacement

Refer to drawing 2 \times 206 located on page 7 of this manual to assist with replacement.

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 the old tube.
5. Push the clip onto the anode housing.

Note:

Do not over-flex the wire when installing the clip, as damage may occur.

Model 44-9 Alpha, Beta and Gamma Detector

Caution!

The mica window of this tube is extremely thin and fragile. There is also a thin layer of material to prevent UV interference. This material may come off if touched, causing the detector to malfunction. DO NOT TOUCH!

6. Carefully install the tube with the window facing down in the housing.
7. Ensure the tube is flush against the screen and tighten the set screws.
8. Replace the back plate and retaining screws.
9. Recalibrate the instrument and detector before use.

Model 44-9 Alpha, Beta and Gamma Detector

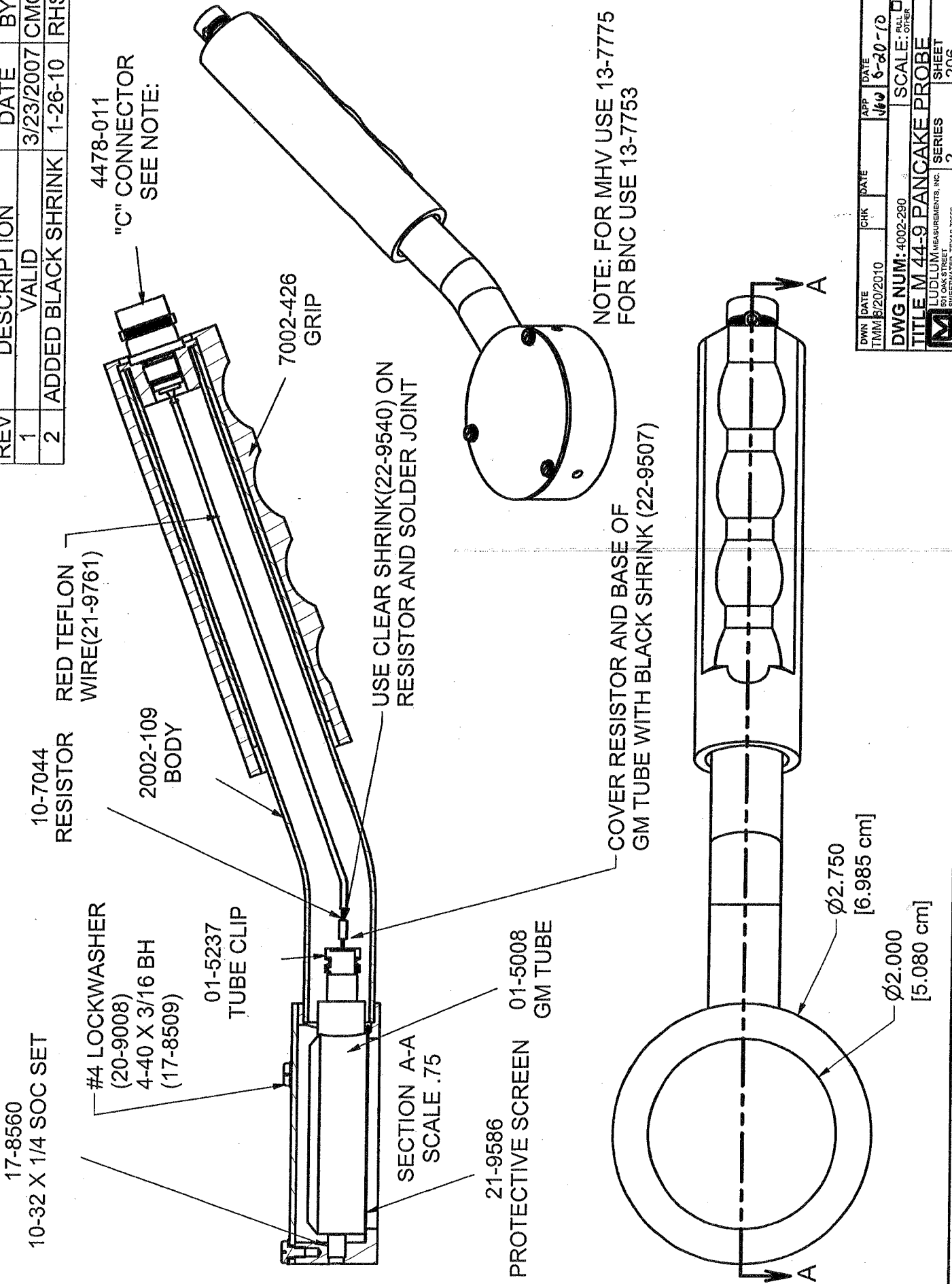
Parts List

Model 44-9 Alpha-Beta-Gamma Detector

<u>Reference</u>	<u>Description</u>	<u>Part Number</u>
UNIT	Completely Assembled Model 44-9 Alpha-Beta-Gamma Detector	47-1539
*	DETECTOR BODY	2002-109
*	HANDLE GRIP	7002-426
*	GM TUBE (LND 7311, TGM N1002)	01-5008
3 EA	SOCKET SET SCREWS (10-34 × ¼)	17-8560
*	PENCIL CLIP	01-5237
*	RESISTOR 3.3M	10-7044
*	CONNECTOR, UG706/U	4478-011
*	HV RED TEFLON WIRE	21-9761
*	PROTECTIVE SCREEN	21-9586
*	SNAP-IN FRONT COVER	7002-1037

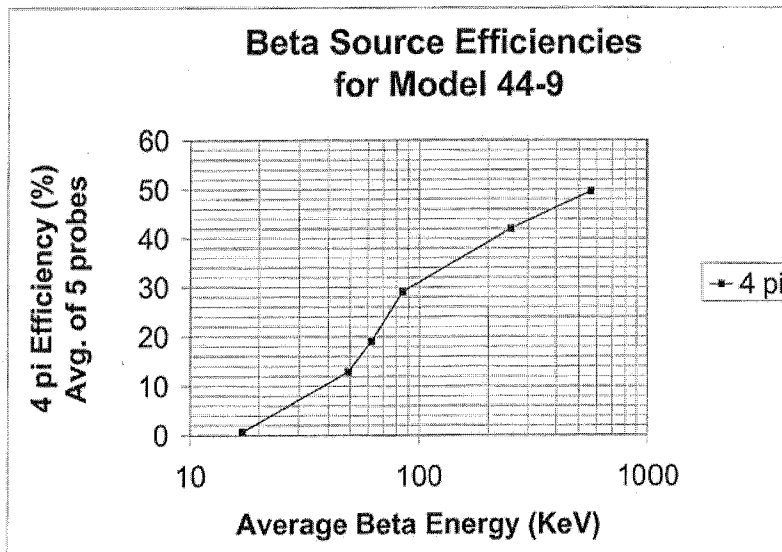
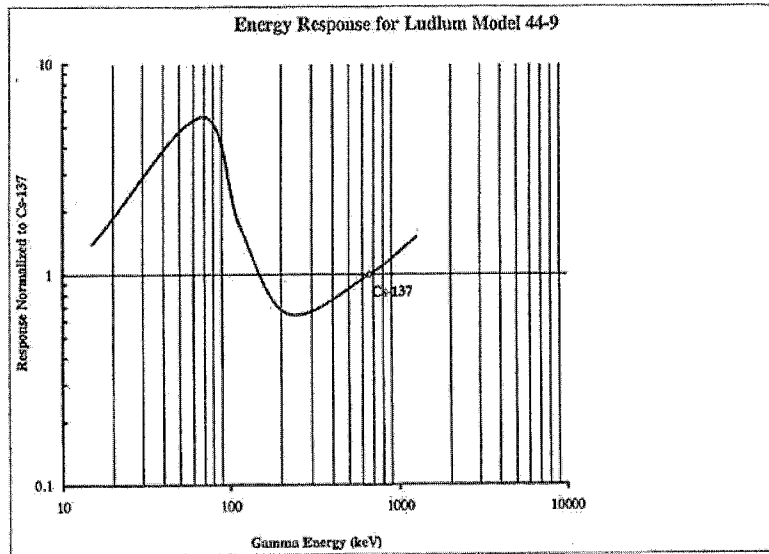
REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	3/23/2007	CMC
2	ADDED BLACK SHRINK	1-26-10	RHS



OWN	DATE	CHK	DATE	APP	DATE
TMM	8/20/2010			1/10	6-20-10
DWG NUM: 4002-290					
TITLE M 44-9 PANCAKE PROBE					
LUDLUM MEASUREMENTS, INC.					
MATERIALS DEPARTMENT					
SWEETWATER, TEXAS 79556					
SCALE: FULL				SHEET	
OTHER				206	
SERIES				2	

Model 44-9 Alpha, Beta and Gamma Detector



**LUDLUM MODEL 44-6
BETA - GAMMA DETECTOR**

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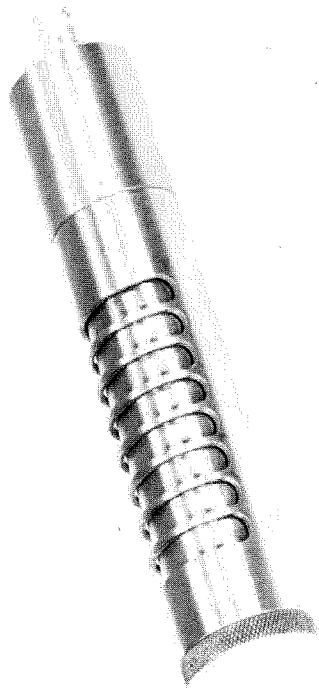
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Introduction

The Ludlum Model 44-6 is a GM (Geiger-Mueller) beta gamma survey detector that can be used with any portable ratemeter or scaler instrument that provides 850-1000 volts with an input sensitivity of 30 ± 10 mV.

The detector incorporates a rotary shield, which when opened, allows the detection of beta radiation for energies above approximately 200 keV. The beta contribution to a measurement can be determined by subtracting the reading with the rotary shield closed from the reading with the shield open. However, the standard meterface units used on a counter with the Model 44-6 detector are expressed in cpm and exposure rate. In this case, the beta contribution can be quantified only in units of cpm, as units of exposure rate do not apply to beta radiation. The shield should always be in the "closed" position when making exposure (mR/hr) measurements.

The gamma response of the Model 44-6 is nominally linear, (within 10%) up to 50mR/hr without instrument dead time correction, and up to 500 mR/hr with dead time correction. Dead time is typically 95 microseconds.



Unpacking and Repacking

Remove the calibration certificate or detector functional check certificate and place it in a secure location. Remove the detector(s) and accessories (if applicable) and ensure that all items listed on the packing list are in the carton. If multiple detectors are included, refer to the calibration certificates for serial number (SN) matches. The Model 44-6 serial number is located on the side of the detector.

To return an instrument or detector for repair or calibration, provide sufficient packing material to prevent damage during shipment and affix appropriate warning labels to promote careful handling. The following items and information should also be included to ensure quick turn-around time of your equipment.

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

Specifications

Indicated Use: beta gamma survey

Detector: 30 mg/cm² stainless steel wall halogen quenched GM

Gamma Sensitivity: typically 1200 cpm/mR/hr (¹³⁷Cs gamma)

Beta Cut Off: approximately 200 keV (*Window open*)

Gamma Energy Response: See the graph located at the end of this manual on page 6.

Dead Time: typically 95 microseconds

Compatible Instruments: general purpose survey meters, ratemeters and scalars

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

Construction: stainless steel with rotary beta window

Temperature Range: -20 to 50 °C (-4° to 122 °F); may be certified for -40 to 65 °C (-40° to 150 °F)

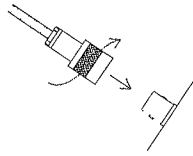
Size: 3.2 x 15.2 cm (1.3 x 6 in.) (Dia x L)

Weight: 0.5 kg (1 lb)

Operating Procedures

CONNECTING TO AN INSTRUMENT

Connect one end of the cable provided to the detector by firmly pushing the connector together while twisting clockwise ¼ turn until latched. Repeat the process in the same manner with the other end of the cable and the instrument.



TESTING THE DETECTOR

1. Ensure that the instrument high voltage (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 8-15 µR/hr).

Model 44-6 Alpha, Beta, Gamma Detector

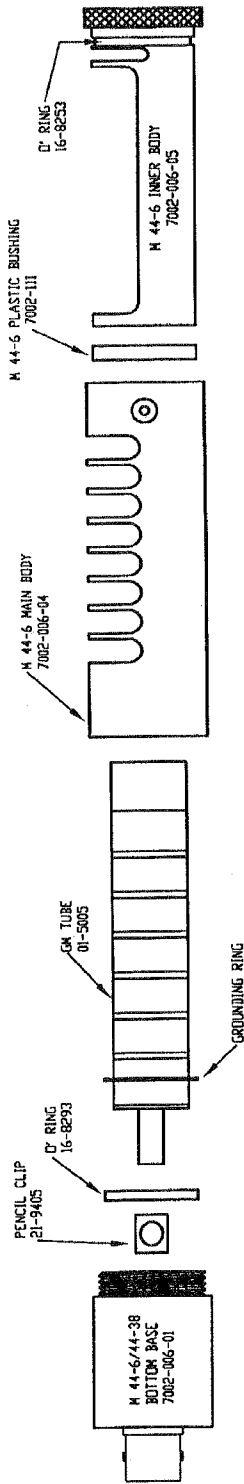
3. If a check source is available, expose the detector to the check source and verify that the instrument indicates within 20% of the check source reading from the last calibration. Alternatively, expose the detector to a source of known value and verify that the detector detects greater than or equal to the efficiency listed in the specification section of this manual.
4. Instruments and detectors, which meet these criteria, are ready for use. Failure to meet these criteria may indicate a malfunction in the detector.

Parts List, Drawings and Diagrams

Model 44-6 Alpha-Beta-Gamma Detector

<u>Reference</u>	<u>Description</u>	<u>Part Number</u>
UNIT	Completely Assembled Detector	Model 44-6 Alpha-Beta-Gamma 47-1535
*	GM TUBE (LND 725, TGM N112)	01-5005
*	O-RING	16-8253
*	TUBE CLIP	01-5237
*	BOTTOM BASE	7002-006-01
*	MAIN BODY	7002-006-04
*	INNER BODY	7002-006-05
*	O-RING FOR INNER BODY	16-8293
*	MAIN BUSHING	7002-111
*	CONNECTOR SERIES "C"	4478-011

Model 44-6 Beta - Gamma Detector



Energy Response for Model 44-6

