

**LUDLUM MODEL 44-38
BETA-GAMMA DETECTOR**

**June 2016
Serial Number PR107884 and Succeeding
Serial Numbers**

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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**

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Introduction

The Model 44-38 is a Geiger-Mueller (G-M) beta/gamma survey detector that is intended to be used with any portable ratemeter or scaler instrument that provides 850-1200 volts with an input sensitivity of 30 ± 10 mV.

The typical gamma exposure rate sensitivity is 1200 cpm per mR/hr. The response range of the Model 44-38 is nominally linear, (within 10%) up to 50 mR/hr without instrument dead time correction and up to 500 mR/hr with dead time correction. Dead time is typically 95 microseconds.

The detector also incorporates a rotary shield, which when opened, allows the detection of beta radiation for energies above approximately 200 keV. If the meter face of the connected electronics is in exposure rate, like mR/hr, then be aware that the beta contribution does not directly correlate to exposure rate. For example, if the meter increases by 2 mR/hr when the shield is opened, it is not correct to say that the exposure rate has increased by 2 mR/hr.



Model 44-38

Note:

Proper gamma exposure rate readings can only be obtained with the shield in the *closed* position.

Note:

The detector does not contain any consumable materials.

Note:

If the detector is used in a manner not intended by the manufacturer, the detector may not function properly.

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 44-38 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.

Every returned instrument must be accompanied by an **Instrument Return Form**, which can be downloaded from the Ludlum website at www.ludlums.com. Find the form by clicking the “Support” tab and selecting “Repair and Calibration” from the drop-down menu. Then choose the appropriate Repair and Calibration division where you will find a link to the form.

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 (window closed): within 20% of
¹³⁷Cs (662 keV) from 60 keV to 1.3 MeV

Dead Time: typically 95 microseconds

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

Operating Voltage: 900 volts

Connector: series "C" (others available)

Construction: anodized aluminum housing with rotary beta window

Window Construction: tin shields mounted on aluminum with a solid aluminum gap in the middle

Low-Energy Blocking Window: tin and aluminum segments are 1353 mg/cm²

Low-Energy Pass-Through Window: the middle aluminum segment is 610 mg/cm²

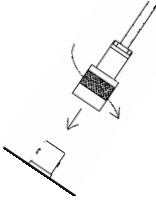
Temperature Range: -20 to 50 °C (-4 to 122 °F); may be certified for -40 to 65 °C (-40 to 150 °F)

Size: 3.3 x 16.5 cm (1.3 x 6.5 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 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

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

Connect the detector to the instrument and check for a proper background reading (typically 25-50 cpm at 8-15 $\mu\text{R/hr}$).

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.

Instruments and detectors that meet these criteria are ready for use. Failure to meet these criteria may indicate a malfunction in the detector.

Safety Considerations

ENVIRONMENTAL CONDITIONS FOR NORMAL USE

Indoor or outdoor use (in a dry environment)

No maximum altitude

Temperature range of -20 to 50 °C (-4 to 122 °F); may be certified for operation from -40 to 65 °C (-40 to 150°F)

Maximum relative humidity of less than 95% (non-condensing)

Pollution Degree 1 (as defined by IEC 664)

CLEANING INSTRUCTIONS AND PRECAUTIONS

The detector may be cleaned externally with a damp cloth, using only water as the wetting agent. Do not immerse the instrument in any liquid. Observe the following precautions when cleaning:

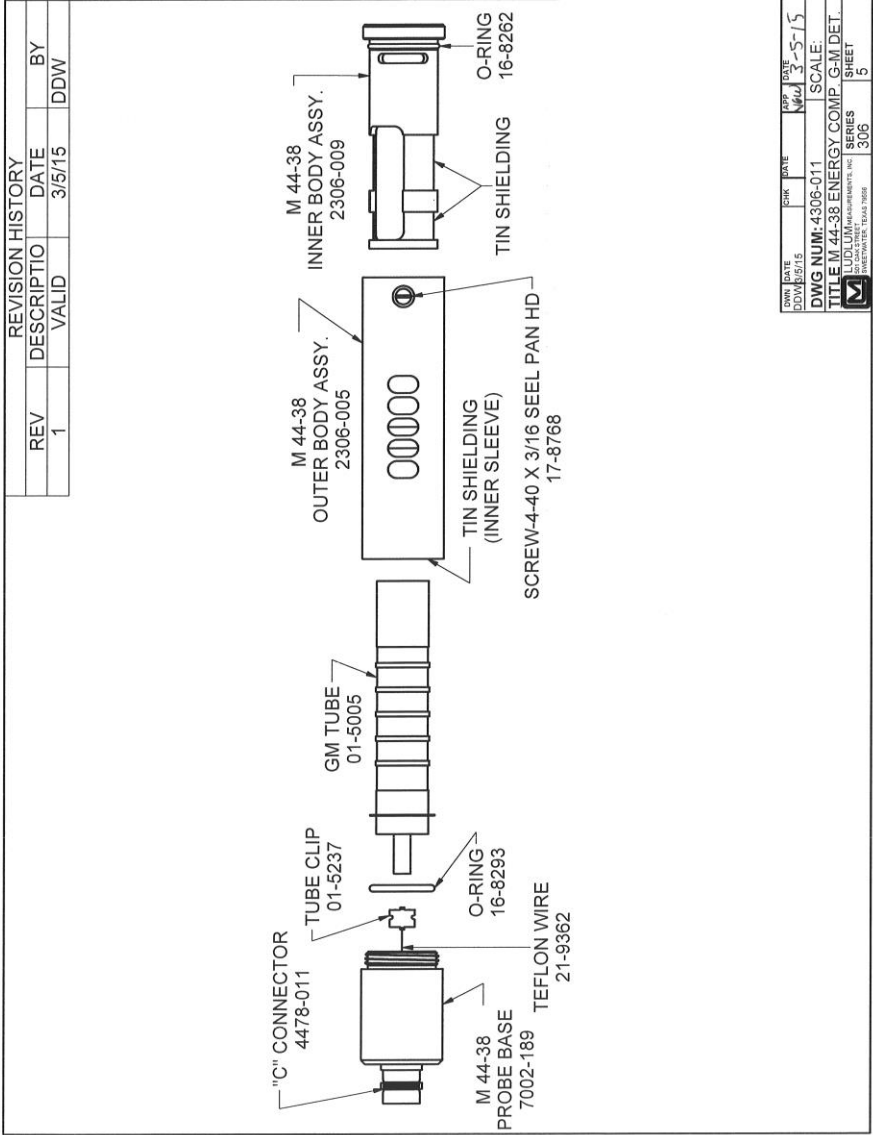
1. Turn the instrument electronics OFF.
2. Allow the instrument to sit for one minute.
3. Disconnect the detector cable before cleaning the detector.

Parts List, Drawings and Diagrams

Model 44-38 Beta-Gamma Detector

<u>Reference</u>	<u>Description</u>	<u>Part Number</u>
UNIT	Completely Assembled Model 44-38 Beta-Gamma Detector	47-1588
1 ea.	G-M TUBE-LND 725	01-5005
1 ea.	CLIP TUBE	01-5237
1 ea.	O-RING	16-8262
1 ea.	O-RING FOR INNER BODY	16-8293
1 ea.	BODY OUTER	2306-005
1 ea.	BODY INNER	2306-009
1 ea.	RECEPT UG706/UG "C" LMI	4478-011
1 ea.	PROBE BASE	7002-189

Model 44-38 Beta-Gamma Detector



REVISION HISTORY			
REV	DESCRIPTIO	DATE	BY
1	VALID	3/5/15	DDW

OWN	DATE	CHK	DATE	APP	DATE
DDW	3/5/15			DDW	3-5-15
DWG NUM: 4306-011 SCALE:					
TITLE M 44-38 ENERGY COMP. G-M DET.					
LUDLUM MEASUREMENTS, INC.					
SERIES 306 SHEET 5					
DALLAS, TEXAS 75248					

