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**LUDLUM MODEL 44-62  
GAMMA SCINTILLATOR**

**February 2018  
Serial Number PR138489 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



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## **Introduction**

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The Model 44-62 sodium iodide (NaI) gamma scintillator is primarily used for detecting low levels of gamma radiation in the range of 60 keV-1.25 MeV. It consists of a 1.3 x 2.5 cm (0.5 x 1 in.) (Dia. X thickness) NaI crystal coupled to a photomultiplier tube and is housed in 0.16 cm (0.062 in.) thick aluminum housing. The detector is energy dependent, over-responding by a factor of 10 or greater in the 100 keV range and under-responding by a factor of 0.5 above 1 MeV when normalized to <sup>137</sup>Cs.

The Model 44-62 will operate with any Ludlum instrument or equivalent instrument that provides 500-1200 volts. The recommended instrument input sensitivity is approximately 10 mV or higher.

Some common applications for this detector include background radiation monitoring, low-level radiation detection, and spectrum analysis when used in conjunction with a single or multi-channel analyzer.



*Model 44-62*

**Note:**

The detector does not contain any consumable materials.

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**Note:**

The detector may not function properly if it used in a manner not intended by the manufacturer.

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## Unpacking and Repacking

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Remove the 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 the carton, refer to the calibration certificate(s) for a serial number (S/N) match. The Model 44-62 S/N is located on the side of the detector near the connector.

To return the instrument or detector for repair or calibration, provide sufficient packing material to prevent damage during shipment and appropriate warning labels to ensure 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](http://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

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**SCINTILLATOR:** 1.3 x 2.5 cm (0.5 x 1 in.) (Dia. x thickness) NaI(Tl) crystal

**SENSITIVITY:** typically 49 cpm/ $\mu$ R/hr ( $^{137}\text{Cs}$  gamma)

**ENERGY RESPONSE:** energy dependent

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

**TUBE:** 1.3 cm (0.5 in) diameter magnetically shielded photomultiplier

**OPERATING VOLTAGE:** 500-1200 volts

**DYNODE STRING RESISTANCE:** 100 megohm

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

**CONSTRUCTION:** aluminum housing with beige powder coat finish

**TEMPERATURE RANGE:** -20 to 50 °C (-4 to 122 °F); may be certified to operate from -40 to 65 °C (-40 to 150 °F)

**SIZE:** 2.3 x 19.8 cm (0.9 x 7.8 in.) (Dia x L)

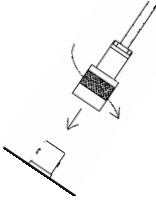
**WEIGHT:** 0.1 kg (0.3 lb)



## **Operating Procedures**

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### **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.
2. Connect the detector to the instrument and check for a proper background reading (typically 1.2 kcpm-2.3 kcpm 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.

## **Safety Considerations**

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### **ENVIRONMENTAL CONDITIONS FOR NORMAL USE**

1. Indoor or outdoor use (in a dry environment)
2. No maximum altitude
3. 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).
4. Maximum relative humidity of less than 95% (non-condensing)
5. Pollution Degree 3 (as defined by IEC 664) (Occurs when conductive pollution or dry nonconductive pollution becomes conductive due to condensation. This is typical of industrial or construction sites.)

### **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

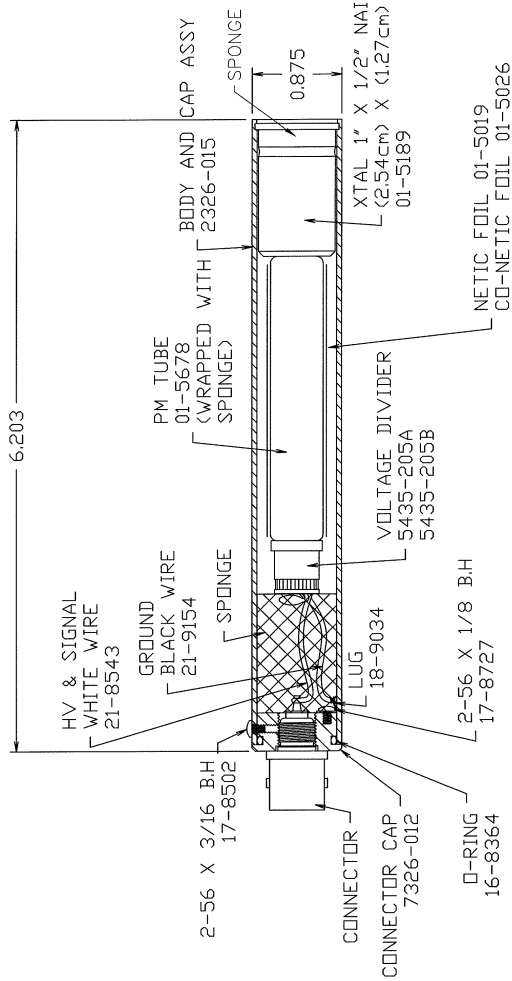
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### Model 44-62 Gamma Scintillator

<u>Reference</u>	<u>Description</u>	<u>Part Number</u>
UNIT	Completely Assembled Model 44-62 Gamma Scintillator	47-1238
1 EA	BODY CASE W/ CAP	2326-015
1 EA	1.3 x 2.5 cm (0.5 x 1 in.) NaI CRYSTAL	01-5189
1 EA	1.3 cm (0.5 in.) PM TUBE	01-5678
1EA	LABEL-SERIAL NUMBER	03-6008
3EA	SCREW 2-56 X 18 BH	17-8727
1EA	LUG 3922-092 #2	18-9034
3IN	WIRE TEFLON #22	21-8993
3IN	WIRE BLACK #26	21-9432
1 EA	RECPT UG706/U "C"	4478-011
1 EA	O-RING	16-8364
*	MAGNETIC FOIL	01-5019/5026
1EA	1.3 cm (0.5 in.) VOLT. DIV.	5435-205A
1EA	1.3 cm (0.5 in.) VOLT. DIV	5435-205B

# Model 44-62 Gamma Scintillator

REV #	ALTERATIONS	DATE	BY
1	ADD VOLTAGE DIVIDER	5-2-88	JDM
2	UPDATE	6-2-88	JDM
3	ADD METRIC MEASUREMENTS	6-28-10	MM
4	UPDATED TO MATCH BDM	12-22-17	ZSZ



DATE	APPROVED
12/22/17	[Signature]

TITLE: 44-62 ASSEMBLY  
 PARTS: 385  
 SHEET: 21

4326-040

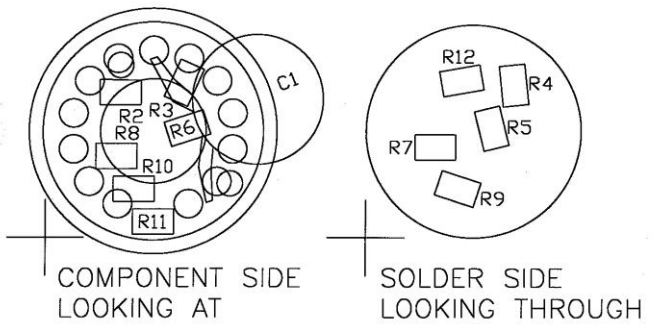
Reference                      Description                                      Part Number

**5.08 cm (2-inch) Voltage Divider Board**

1EA	VOLTAGE DIVIDER	6002-628
1EA	CAP 0.01 $\mu$ F 1kv	04-5511
10 EA	RES 4.75 meg 1W, 1%	12-7013
1 EA	RES 1 meg 1W, 1%	12-7020
1IN	SHRINK 0.16 cm (one-sixteenth inch)	22.9501

# Model 44-62 Gamma Scintillator

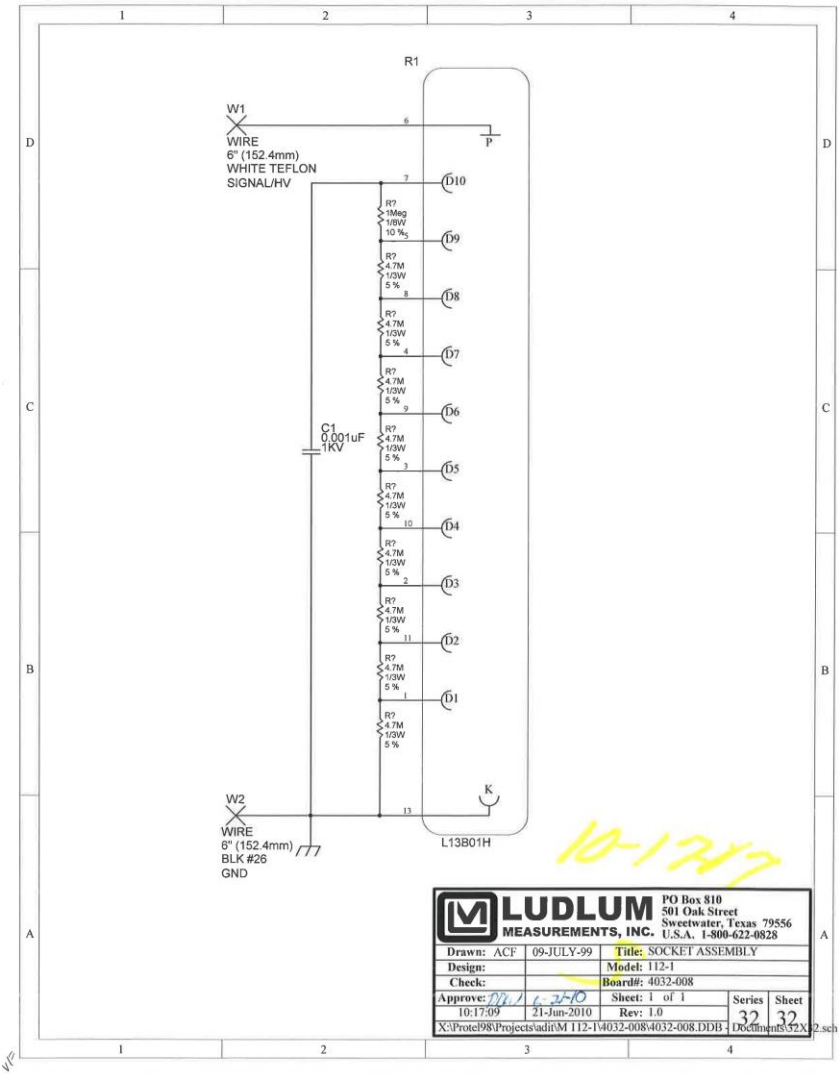
REV #	ALTERATIONS	DATE	BY



SCALE=5-1

DWN ACT	DATE 3-MAR-99	CHECKED CKB 04-NOV-99	APPROVED RDS 4-NOV-99
TITLE: M 112-1 VOLT DIV FOR TUBE L13B01H			
LUDLUM MEASUREMENTS, INC. 500 ONE STREET PUEBLO, TEXAS 75066		SERIES 2	SHEET 631

# Model 44-62 Gamma Scintillator



<b>LUDLUM</b>		PO Box 810	
<b>MEASUREMENTS, INC.</b>		501 Oak Street	
		Sweetwater, Texas 79556	
		U.S.A. 1-800-622-0828	
Drawn: ACF	09-JULY-99	Title: SOCKET ASSEMBLY	
Design:		Model: 112-1	
Check:		Board#: 4032-008	
Approve: <i>[Signature]</i>	6-2-10	Sheet: 1 of 1	Series
10-17-09	21-Jun-2010	Rev: 1.0	32 32
X:\Protel98\Projects\adit\M 112-1\4032-008\4032-008.DDB		Documents\32x	