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**LUDLUM MODEL 43-2-2**  
**ALPHA/BETA SCINTILLATOR**

**August 2015**  
**Serial Number 156003 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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## **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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## General

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The Model 43-2-2 alpha/beta detector scintillator is primarily used for alpha or beta surveying and wipe tests. It consists of a 3.8 cm (1.5 in.) diameter magnetically shielded photomultiplier tube and is housed in a 0.157 cm (0.062 in.) aluminum housing with a 0.8 mg/cm<sup>2</sup> metallized polyester window.

The Model 43-2-2 will operate with the Ludlum Model 2224 scaler/ratemeter, Model 2225 scaler/ratemeter, and the Model 2929 sample counter.



## Specifications

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**Indicated Use:** alpha beta survey

**Window:** two layers of 0.8 mg/cm<sup>2</sup>

**Window Area:** active and open are 9.7 cm<sup>2</sup>

**Efficiency (4 $\pi$  geometry):** 25% for <sup>239</sup>Pu; 20% for <sup>90</sup>Sr/Y; 5% for <sup>14</sup>C

**Background:** alpha is less than 3 cpm; beta is typically 50 cpm or less

**Cross Talk:** alpha to beta is less than 10%;

beta to alpha is less than 1%

**Scintillator:** ZnS (Ag) adhered to 0.25 cm (0.10 in.)

**Multiplier Tube:** 3.8 cm (1.5 in.) diameter

**Dynode String Resistance:** 100 megohm

**Operating Voltage:** 500-1200 Vdc

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

**Construction:** aluminum housing with beige powder-coat finish

**Temperature Range:** -20 to 50 °C (-4 to 122 °F)

**Size:** 5.1 x 18.5 cm (2 x 7.3 in.) (Dia x L)

**Weight:** 0.30 kg (0.66 lb)

## **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(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 serial number is located on the detectors' bottom plate.

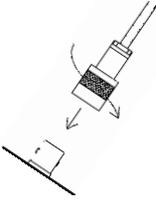
To return an instrument or detector for repair or calibration, provide sufficient packing material to prevent damage during shipment and affix appropriate warning labels to promote careful handling.

Every returned instrument must be accompanied by an **Instrument Return Form**, which can be downloaded from the Ludlum website at [www.ludlums.com](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.

## **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 one 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 3 cpm or less).
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 that meet these criteria are ready for use. Failure to meet these criteria may indicate a malfunction in the detector.

## Parts List

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### Model 43-2-2 Alpha Scintillator

Reference	Description	Part Number
UNIT	Completely Assembled Model 43-2-2 Beta/Alpha Scintillator	47-2003
*	DETECTOR BODY	2002-320
1 EA	END CAP	7002-029-02
1 EA	TUBE SHIELD	40-4006
1 EA	1.5 INCH TUBE SOCKET BOARD	5002-502
1EA	CONNECTOR, UG 706/U	13-7751
3 INCH	TEFLON WIRE	21-9362
3 INCH	#24 BLACK WIRE	21-9558
1 EA	LUG	18-8766
4 EA	SCREWS	17-8811
2 EA	SPONGE	7002-029-05
1 EA	MYLAR WINDOW ASSY	40-4375
1 EA	GASKET	7002-064-12

### 1.5 inch Socket Board

Reference	Description	Part Number
1 EA	CIRCUIT BOARD	5002-502
1 EA	CAP 0.01 mf 2kV	04-5525
11 EA	RES 10 meg 1/4 w 2%	10-7106
1 EA	RES 1 meg 1/8 w 1% SMT	12-7844
1 EA	JACK-TEST 1128-09-0319	18-8806
1 EA	CONTACT #1434	18-9124

## **Drawings and Diagrams**

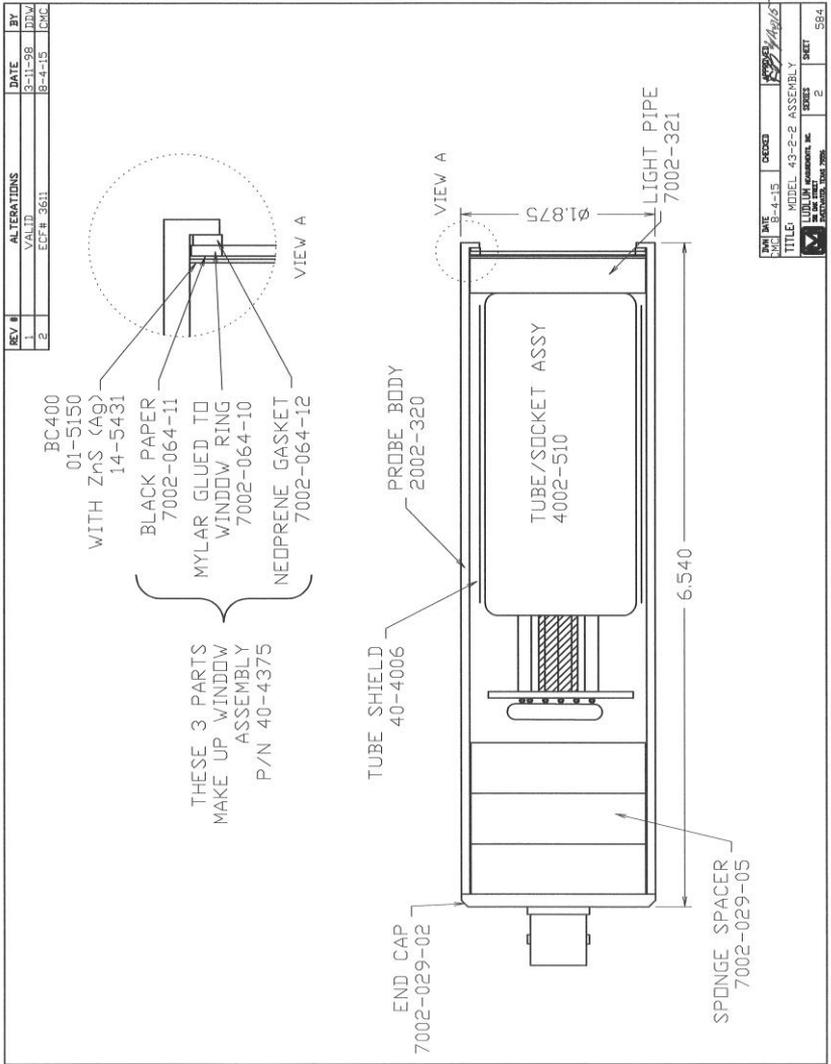
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Assembly View, Drawing 2 x 584

1.5 inch Tube Socket Board, Drawing 2 x 317

1.5 inch Tube Socket Component Outlines, Drawing 2 x 318

# Model 43-2-2 Alpha/Beta Scintillator



PART NAME	QTY	CREG	REV	DATE
VAL ID	1	8-4-15	1	8/20/15

TITLE: MODEL 43-2-2 ASSEMBLY  
 SHEET NO. 2  
 SHEET 2  
 584

# Model 43-2-2 Alpha/Beta Scintillator

