

**LUDLUM MODEL 44-98
BGO Scintillator**

August 2025

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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: SERVICE DEPARTMENT
501 OAK STREET
SWEETWATER, TX 79556

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

Model 44-98 BGO Scintillator
August 2025

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1. GENERAL

The Ludlum Model 44-98 BGO (Bismuth Germanate Oxide) detector is used primarily for the detection of low-energy gamma radiation. The Model 44-98 will also detect beta energy as low as 17 keV. Both ^{125}I and ^{14}C could be detected with the Model 44-98, for example.

The detector consists of a 2.5 cm (1 in.) diameter by 1 mm (0.04 in.) thick BGO

scintillator. The window area is approximately 5 cm^2 and is covered by 1.2 mg/cm^2 metalized polyester for light tightness.

The Model 44-98 may be used with Ludlum instruments or equivalent instruments that can provide up to 1300 volts and have an input sensitivity of 5 mV to 10 mV.

2. SPECIFICATIONS:

Voltage Requirements: 500 volts to 1200 volts maximum

Scintillator: 2.5 cm (1 in.) diameter by (0.04 in.) 1 mm thick BGO crystal (non-hygroscopic)

Photomultiplier Tube: 3.8 cm (1.5 inch) diameter, 10-stage, head-on type, magnetically shielded

Connector: standard series "C," other types available upon request

Window Area: 5 cm^2

Window Density: 1.2 mg/cm^2

Background: 650 cpm or less (in a $10\text{ }\mu\text{R/hr}$ field)

Detector Uniformity: within 10% of average reading

Efficiency (4π): 15% for ^{125}I ; 8% for ^{129}I ; 3% for ^{14}C

Input Sensitivity: typically 5 to 10 mV

Recommended Energy Range Operation: 10 keV to 145 keV gamma

Size: 4.8 x 18.7 cm (1.9 x 7.4 in.) (Dia x L)

Construction: aluminum

Weight: 0.5 kg (1 lb)

Finish: polyurethane computer beige paint

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3. REPLACEMENT PARTS LIST

Ref. No.	Description	Part No.
Model 44-98 BGO Scintillator		
UNIT	Completely Assembled Model 44-98 BGO Scintillator	47-2465
Assembly View, Drawing 2 x 236		
● MISCELLANEOUS		
*	PM Tube/Socket Assembly	4002-510
*	1.5 inch Photomultiplier Tube	01-5349
*	BGO Scintillator	01-5284
*	Window Assembly	2002-358
*	Light Pipe	7002-353
*	Gasket	7002-355
*	Tube Shield	40-4006
*	Connector, Series "C"	4478-011
2 EA.	Sponge	7002-029-05
3.8 cm (1.5 in.) Tube Socket Board, Drawing 2 x 317		
*	Assembled Tube Socket Board	5002-502
● CAPACITORS		
C1	0.01: μ F, 3kV 56430GAS10	04-5525
● RESISTORS		
R2	1 MEG, $\frac{1}{4}$ W, 1%	12-7844
R1	10 MEG, $\frac{1}{4}$ W, 2%	12-7996
R3-R6	10 MEG, $\frac{1}{4}$ W, 2%	12-7996
R11	10 MEG, $\frac{1}{4}$ W, 2%	12-7996
R101-R104	10 MEG, $\frac{1}{4}$ W, 2%	12-7996
R111	10 MEG, $\frac{1}{4}$ W, 2%	12-7996

4. DRAWINGS AND DIAGRAMS

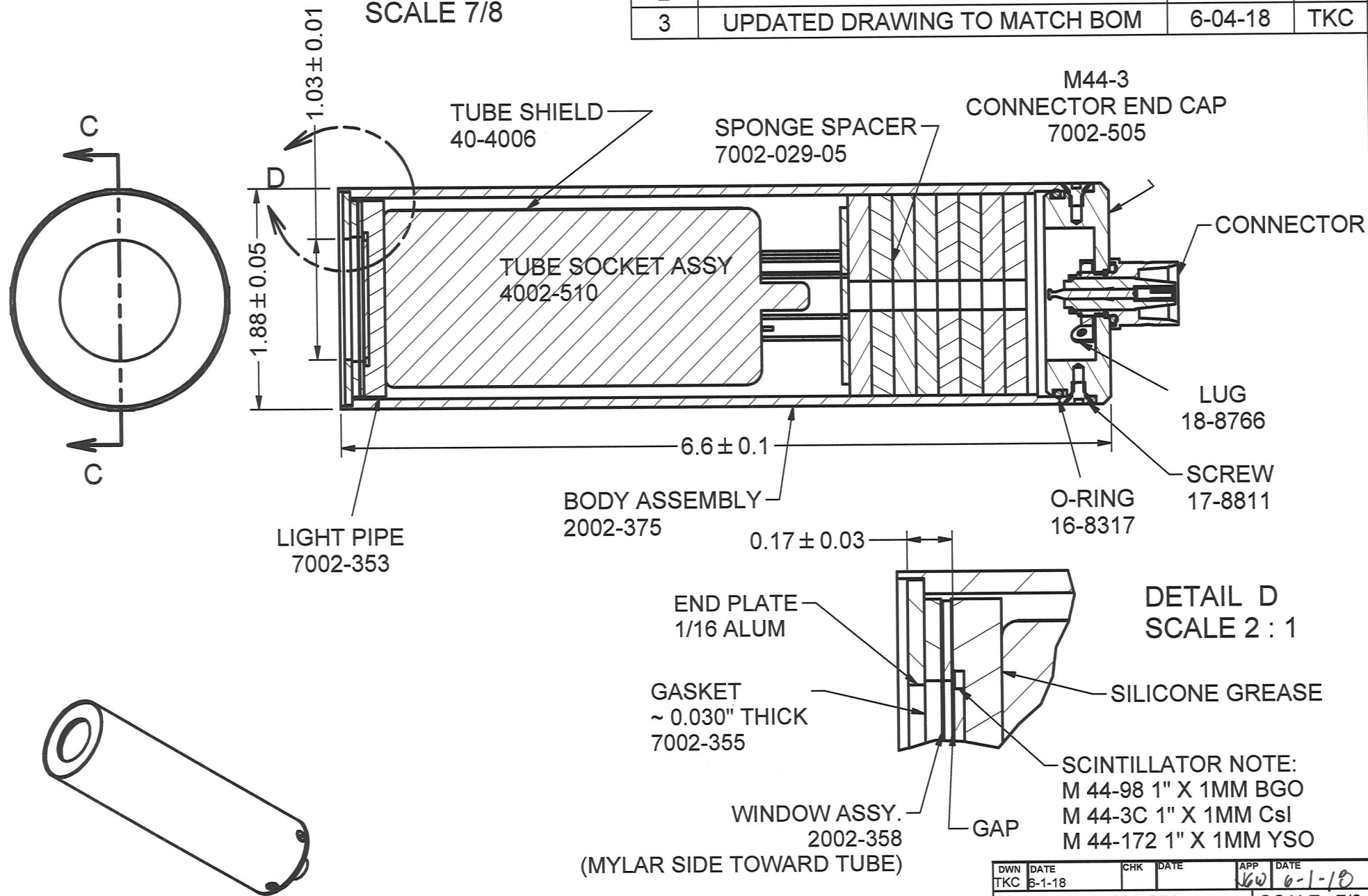
Assembly View, Drawing 2 x 236

3.8 cm (1.5 in.) Tube Socket Board, Drawing 2 x 317

3.8 cm (1.5 in.) Tube Socket Component Layout, Drawing 2 x 318

Window Assembly, Drawing 2 x 232A

SECTION C-C
SCALE 7/8



(MYLAR SIDE TOWARD TUBE)


*(M 44 -3C 2002-358-3)

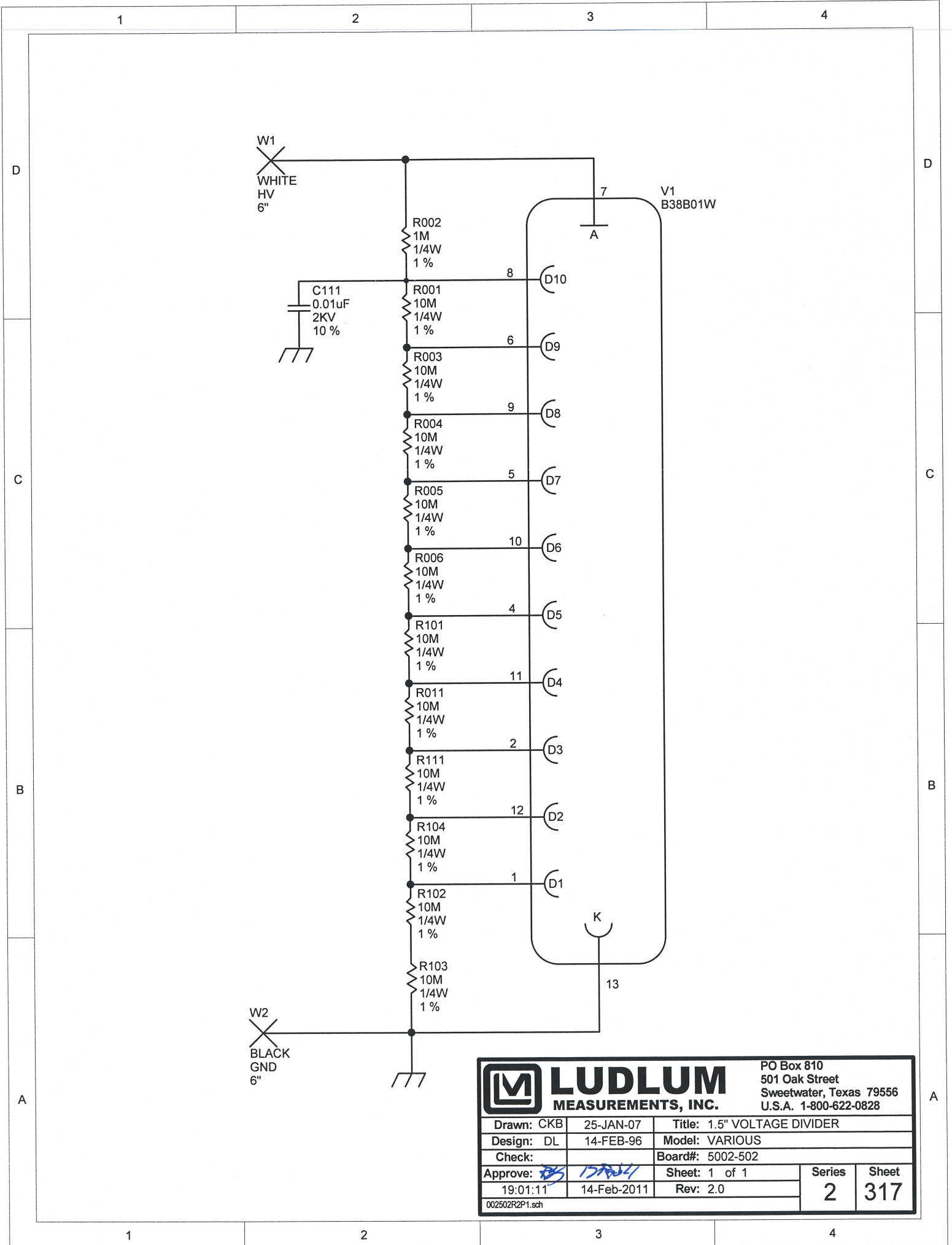
REVISION HISTORY

REV	DESCRIPTION	DATE	BY
2	VALID ECF- 2118	8-15-07	CMC
3	UPDATED DRAWING TO MATCH BOM	6-04-18	TKC

DETAIL D
SCALE 2 : 1

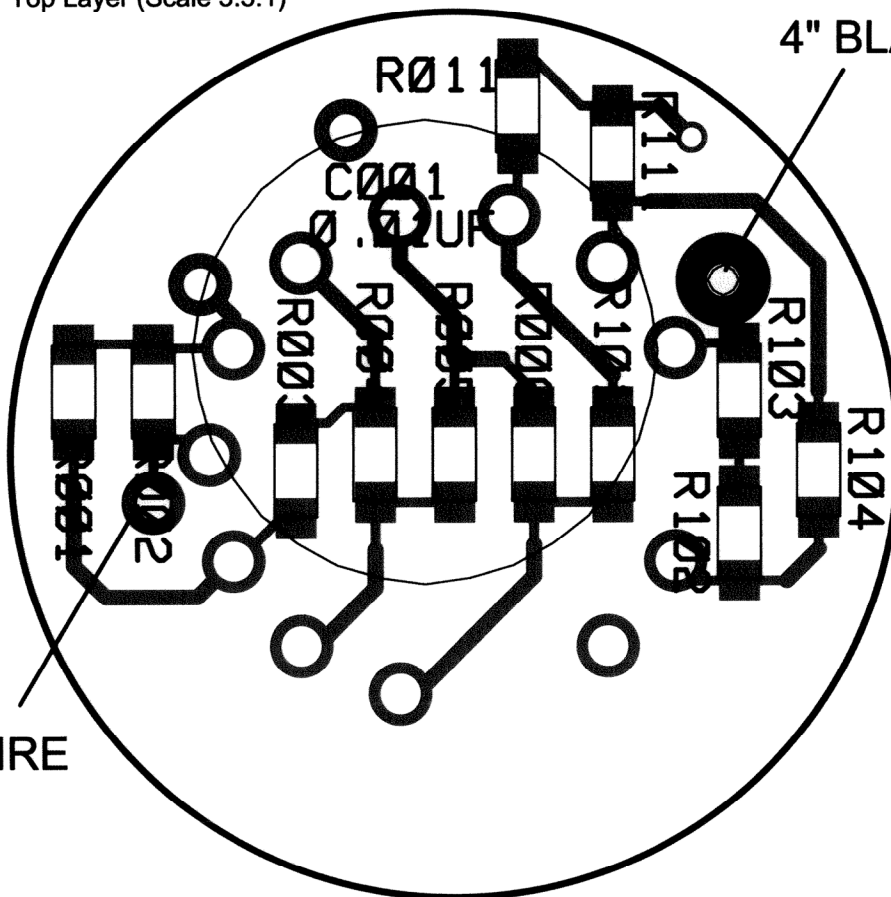
SCINTILLATOR NOTE:
M 44-98 1" X 1MM BGO
M 44-3C 1" X 1MM CsI
M 44-172 1" X 1MM YSO

DWN TKC	DATE 6-1-18	CHK	DATE	APP KW	DATE 6-1-18
DWG NUM: 4002-371				SCALE: 7/8	
TITLE M 44-98, 44-3C, 44-172 ASSY					
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556				SERIES 2	SHEET 236



		PO Box 810 501 Oak Street Sweetwater, Texas 79556 U.S.A. 1-800-622-0828	
Drawn: CKB	25-JAN-07	Title: 1.5" VOLTAGE DIVIDER	
Design: DL	14-FEB-96	Model: VARIOUS	
Check:		Board#: 5002-502	
Approve: <i>DL</i>	14-Feb-2011	Sheet: 1 of 1	Series
19:01:11	14-Feb-2011	Rev: 2.0	Sheet
002502R2P1.sch			2 317

4" BLACK WIRE



4" WHITE WIRE



LUDLUM MEASUREMENTS

Model: N/A

Desc: 1.5" VOLTAGE DIVIDER

2

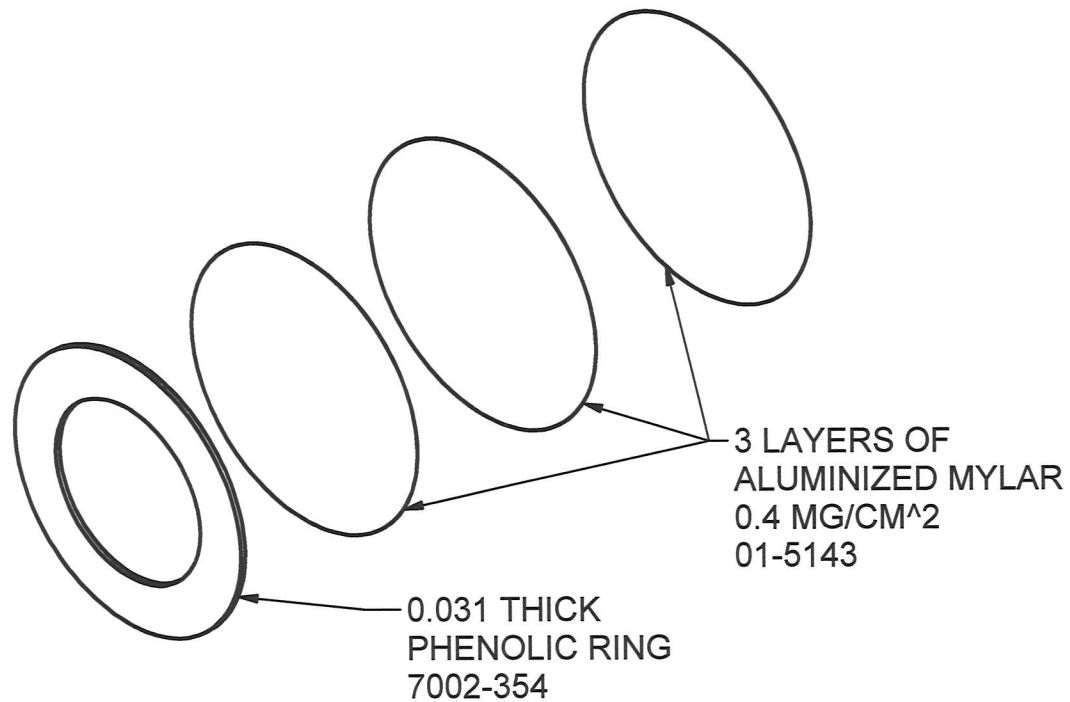
SHEET


219

\\freedom\pcb\Projects\LM1\VoltageDividers\5002-502\Rev

219

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	5-14-99	DDW



DWN	DATE	CHK	DATE	APP	DATE
TKC	5-23-18			Ndw	6-2-18
DWG NUM: 2002-358				SCALE: 1:1	
TITLE MODEL 44-98, 44-172 WNDW ASSY.					
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 2	SHEET 232A	